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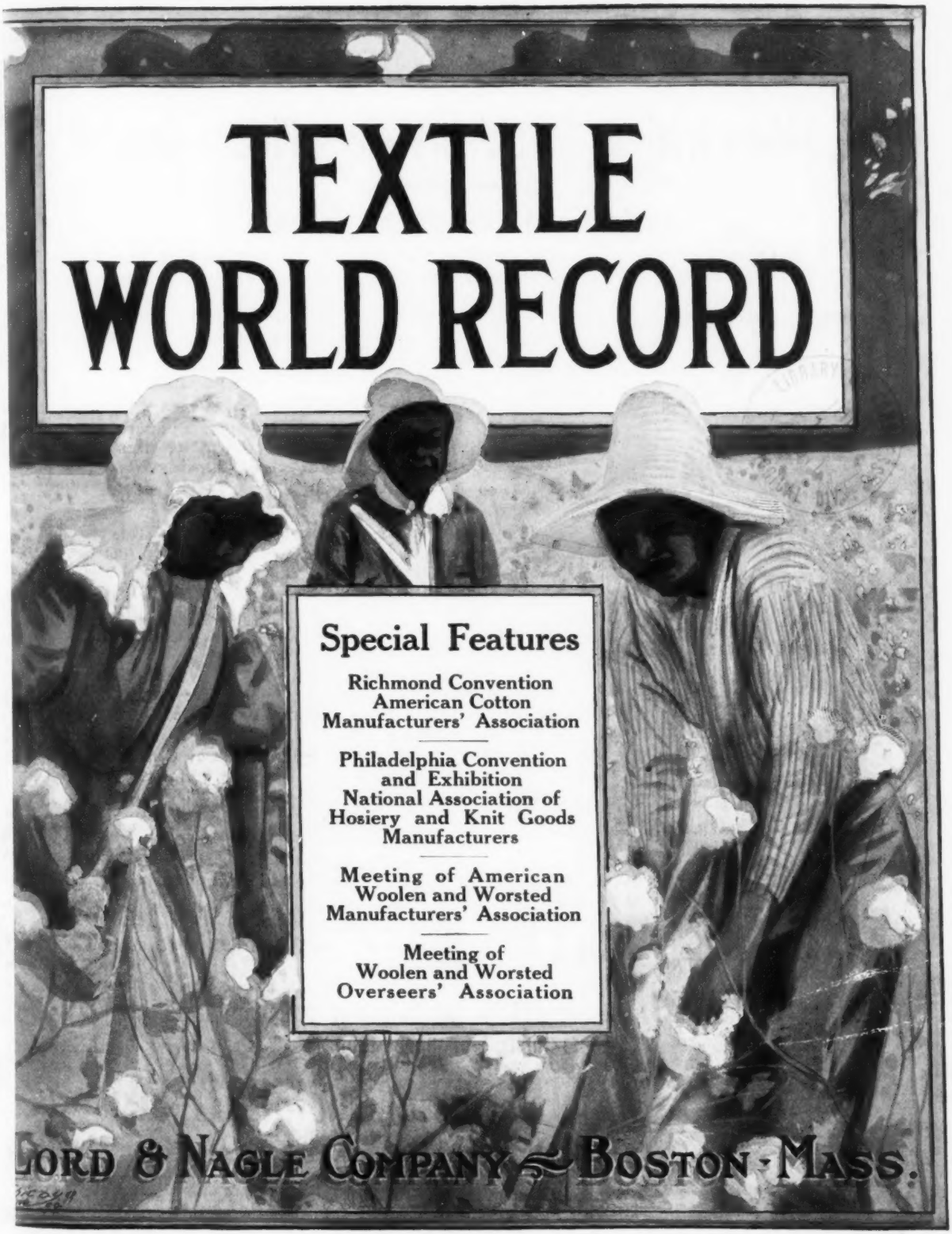

Special Features

Richmond Convention
American Cotton
Manufacturers' Association

Philadelphia Convention
and Exhibition
National Association of
Hosiery and Knit Goods
Manufacturers

Meeting of American
Woolen and Worsted
Manufacturers' Association

Meeting of
Woolen and Worsted
Overseers' Association

LORD & NAGLE COMPANY ~ BOSTON - MASS.

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Mercerizing Machinery for Piece Goods

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All Kinds of Outfits for Bleaching Thread and Soft Twisted Yarns.
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THE TEXTILE-FINISHING MACHINERY CO.

Howard Building, Providence, R. I.

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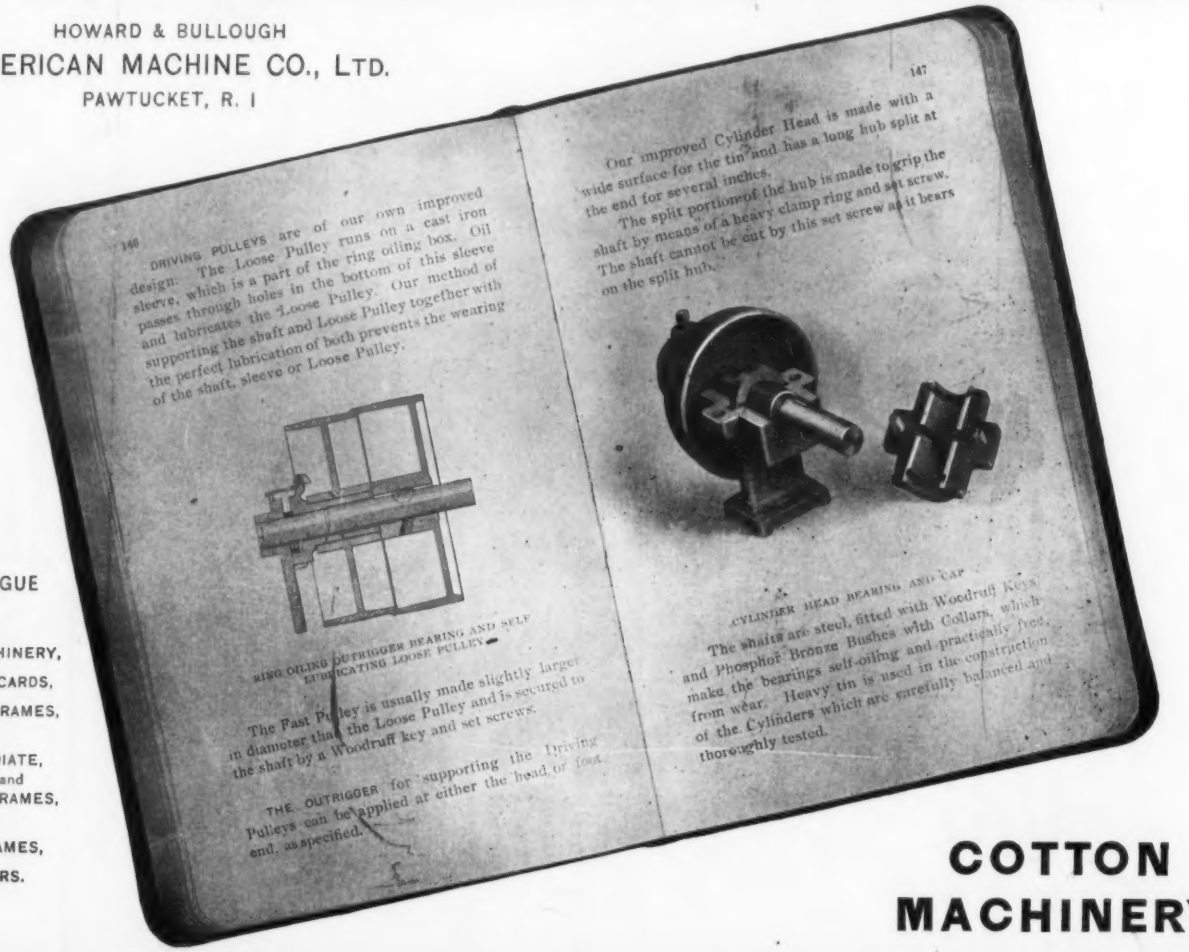
Correspondence

We solicit correspondence on textile subjects. Articles accepted will be paid for. Name and address must always be given, not necessarily for publication. Subscribers are invited to make free use of our Questions and Answers Department; correspondence is strictly confidential.

HOWARD & BULLOUGH
AMERICAN MACHINE CO., LTD.
PAWTUCKET, R. I


146
DRIVING PULLEYS are of our own improved design. The Loose Pulley runs on a cast iron sleeve, which is a part of the ring oiling box. Oil passes through holes in the bottom of this sleeve and lubricates the Loose Pulley. Our method of supporting the shaft and Loose Pulley together with the perfect lubrication of both prevents the wearing of the shaft, sleeve or Loose Pulley.
RING OILING OUTRIGGER BEARING AND SELF LUBRICATING LOOSE PULLEY
The Fast Pulley is usually made slightly larger in diameter than the Loose Pulley and is secured to the shaft by a Woodruff key and set screws.
THE OUTRIGGER for supporting the Driving Pulleys can be applied at either the head or foot end, as specified.
147
Our improved Cylinder Head is made with a wide surface for the tin and has a long hub split at the end for several inches.
The split portion of the hub is made to grip the shaft by means of a heavy clamp ring and set screw. The shaft cannot be cut by this set screw as it bears on the split hub.
CYLINDER HEAD BEARING AND CAP
The shafts are steel, fitted with Woodruff Keys and Phosphor Bronze Bushes with Collars, which make the bearings self-oiling and practically free from wear. Heavy tin is used in the construction of the Cylinders which are carefully balanced and thoroughly tested.

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REV. FLAT CARDS,
DRAWING FRAMES,
SLUBBING, INTERMEDIATE, ROVING and JACK FRAMES,
SPINNING FRAMES,
TWISTERS.

COTTON MACHINERY

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TEXTILE WORLD RECORD

JUNE, 1911

Monthly Comment.

Wool Goods for Enlisted Men

The report that the War Department had decided to substitute woolen cloth for the worsted fabrics heretofore used for the uniforms of enlisted men led us to apply to the Quartermaster General for information regarding the matter. In reply we received the following letter with samples of the sky blue woolen cloth and the olive drab worsted:

War Department,
Washington, May 18, 1911.

Editor Textile World Record:

Sir:—I am directed by the Quartermaster General to acknowledge the receipt of your letter of the 13th inst., and in reply to inform you that the Secretary of War having approved the use of woolen fabrics in lieu of worsted for enlisted men of the U. S. Army, this Department proposes to invite proposals on 60 days' notice, bids to be opened in the near future for furnishing such materials of the character stated, as may be required for the next fiscal year. Ample time is to be given in which to give manufacturers an opportunity to make up samples.

The question of economy enters largely into the change; also the desire for wider competition and the fact that foreign nations have found, by long usage, that woolens are especially adapted to the military service.

For several years past the Department has been considering this change due to the fact of the high cost of worsteds and to the further fact that until very recently there have been but two or three mills able to compete in supplying worsteds. At the last opening of sky blue kersey (wool 22 ounce) required in the manufacture of regulation dress trousers, the lowest price was $1.50 and contract was awarded at that price. On the same date bids for 22 ounce olive drab kersey (worsted) used in the manufacture of overcoats were opened and contract awarded at $2.30 on the lowest bid, showing a difference of 80 cents per yard in the two fabrics.

It is also believed wider competition will be encouraged owing to the large number of woolen plants throughout the country. Census Bulletin No. 74 states the number of woolen establishments to be 792 and worsteds 226.

The fabrics as now adopted will be a 22 ounce and 16 ounce olive drab woolen Melton, a 16 ounce olive drab woolen Bedford cord and a 13 ounce olive drab woolen cloth. All of these are to be made of strictly 3/8 blood wool, 54 to 56 inches in width. In finish and general appearance they will correspond closely to the old 22 ounce sky blue kersey.

Manufacturers desiring to submit samples will not be limited in the number submitted and their ideas and suggestions will be welcomed by the Department. They will, however, be required to submit samples of wool in the grease and warp and filling yarns. All samples submitted will be carefully examined by a Board of Officers assisted by experts and the contracts will be based on samples which represent the greatest value and are still commercial fabrics (except as to color) and capable of being manufactured by all who so desire, taking into consideration the adaptability to the military service. Tests will include exposure, strength, dyes, shrinkage, etc.

From deliveries, which this accepted sample will represent, standard samples and materials entering therein, will be adopted by the Department for future guidance.

It is believed in this way that all who so desire will be given an opportunity to bid and to make the standard samples for the Department.

This office would be glad to receive any comments which you may care to make together with any suggestions which you deem advisable in order that the Department may profit by your advice.

Respectfully,
J. R. R. Hannay,
Captain and Quartermaster, U. S. Army.

It is well to explain at the start that neither of the two fabrics is a kersey as that

term is commonly understood in the woolen trade. They are both meltons, fulled and finished without any nap. The specifications (No. 844) for the olive drab worsted cloth provide that it shall weigh 22 ounces per yard, 54 to 56 inches wide, and have not less than 3,600 ends in the warp and 62 picks per inch in the filling, both warp and filling to be single worsted. The specifications (No. 819) for the sky blue woolen kersey provide that it shall weigh from 22 to 24 ounces per yard, 54 to 56 inches wide, and have not less than 2,700 ends in the warp and 55 picks per inch in the filling. Both are to be woven with a 4-leaf twill, and it is provided that the goods shall be of a certain strength and finish, and made of high half blood American wool. While the specifications contain no requirements as to the size of the yarn, the average count in a fabric meeting the requirements as to weight and set would be 9s for the worsted and 2 5/8 runs for the woolen. These counts are for the yarn as it lies in the finished cloth, no allowance having been made for loss of weight or shrinkage in length.

It is not surprising that the Department has decided to substitute a woolen cloth for the olive drab worsted, for a melton is essentially a carded woolen fabric. The hard, felted, leathery and durable face can be best obtained only by the carded woolen process, which leaves the fibers lying in a confused mass at every possible angle to one another. The worsted process leaves the fibers parallel in the yarn, which is thus specially adapted, not for a leathery melton finish, but for a clear face. Moreover the drawing and gilling in the worsted process tends to destroy the felting properties of the wool by removing the scales from the fibers, whereas, these scales are but slightly affected by carding in the carded woolen process. As a result of these two points of difference it is possible to produce a stronger, better felted and more serviceable melton having a better covered face out of shorter and lower priced wool by the carded woolen process. The removal of the short fibers (noils) by the worsted process is not only unnecessary, but in fact detrimental to such fabrics as the two under consideration, because it impairs the felting property and increases the cost of the material. The right way and the wrong way of making a melton are at once disclosed by an examination of the two cloths received from Capt. Hannay. The woolen cloth is a firm, solid fabric having a well felted, smooth, durable face, while the worsted has a soft, bulky handle and fuzzy face which would soon wear off. The worsted cloth feels much heavier, although when the two are placed on the balance we find that the woolen cloth is the heavier by nearly half an ounce per yard. And these differences exist between the two fabrics in spite of the fact that the worsted cloth has 130 warp and filling threads per square inch, as compared with 105 threads in the woolen cloth.

The difficulty which the War Department has encountered arises from the attempt to employ the worsted process in the manufacture of goods for which it is not adapted. The carded woolen and worsted processes each have their peculiar uses, and it would be as useless and wasteful to attempt the production of a clear worsted face by the carded woolen process, as it is to attempt the manufacture of a melton by the worsted process. The surprise, therefore, is not over the change from worsted to carded woolen, but that the Department should ever have specified that the melton fabric should be made by the worsted process.

Capt. Hannay's letter shows a commendable disposition to bring the specifications for army goods into harmony with the requirements of the wool manufacturing trade, and we hope woolen manufacturers generally will cooperate with the Department and give the officials the benefit of their advice and assistance even when they are not in a position to bid for army contracts. There is a general reluctance among wool manufacturers to manufacture for the government, owing to the fear of arbitrary and unreasonable requirements. Capt. Hannay's letter indicates a desire to bring the government business into closer conformity with the regular trade, and woolen manufacturers should do what they can to promote that object.

A Hand Book of Weaves

Our July issue will contain the first installment of what we believe to be the best work on weave construction ever published in any language. It is from the German work, Die Mechanische Technologie der Weberei, by G. Hermann Oelsner, director of the weaving school at Werdau. Eight editions of this book have been published in Germany. It has been translated and revised by the editor of this magazine. It treats of both single and double weaves, beginning with the simplest constructions.

British Cotton

The annual meeting of the British Cotton Growing Association was held last month, and the Earl of Derby, who is president of the association drew a rather discouraging picture of the enterprise. First came this reference to the finances of the company:

> I will put in a few words what I gather is our position. We have got a total amount subscribed, roughly, of £450,000. Out of that £137,000, as I have said, has gone. Well, now, when you talk of a thing that has gone, there are two ways also of looking at that. We have put on the one hand what we have spent; we put on the other side the assets, which do not come up to what we have spent, but we have got that which I do believe will be the foundation on which we shall build success. We have experience, and we know where we are likely to succeed and where we are not likely to succeed.

Next came this reference by the president to the conditions in the different colonies:

> There would be seen in the report an approximate estimate of the cotton grown more or less directly under the auspices of the Association, and how fluctuating this was. Sierra Leone they had had to abandon. The Gold Coast was stationary. Lagos from a production in 1909 of 12,000 bales had dropped to 6,000, and, he was afraid, from reports received would probably not exceed that amount this year. All this showed that on the West Coast of Africa they were apparently meeting with a check. He thought they might take it that this check was entirely climatic. There was nothing else that they could see to hinder them from going ahead, but they could not control the weather, and there it had undoubtedly been against them. On the other hand, in Uganda they saw an enormous increase in the cotton-growing of that country, an increase which he was glad to think was likely to be still greater in the present year.
>
> He did not want to be too optimistic, but he thought he might safely say that in those places where at the present moment their money was being expended there was none which they could look on as being a failure. Some were better than others, but in all places where their money was now being spent they could practically calculate on getting at all events some return for it. In some places, as the Juba river, the Sudan, and Rhodesia, it was hoped there would be an early and rapid development of cotton-growing.

The Latest "Pure Textile" Bill

A bill providing for the branding and labeling of goods made wholly or in part of wool has been introduced in the House of Representatives by Congressman A. Mitchell Palmer, of Pennsylvania. It begins by prohibiting the manufacture within any Territory or the District of Columbia any wool goods which are misbranded within the meaning of this Act." That sounds well, but upon thinking it over one is disposed to inquire whether the Hon. A. Mitchell Palmer proposes to have wool goods properly branded during the process of manufacture, so that they will come from the machinery bearing the proper brand within the meaning of the Palmer Act. The bill next prohibits the introduction of misbranded wool goods into any State or Territory or the District of Columbia. The sale or offering for sale of misbranded wool goods is declared to be a misdemeanor punishable by fine or imprisonment or both in the discretion of the court.

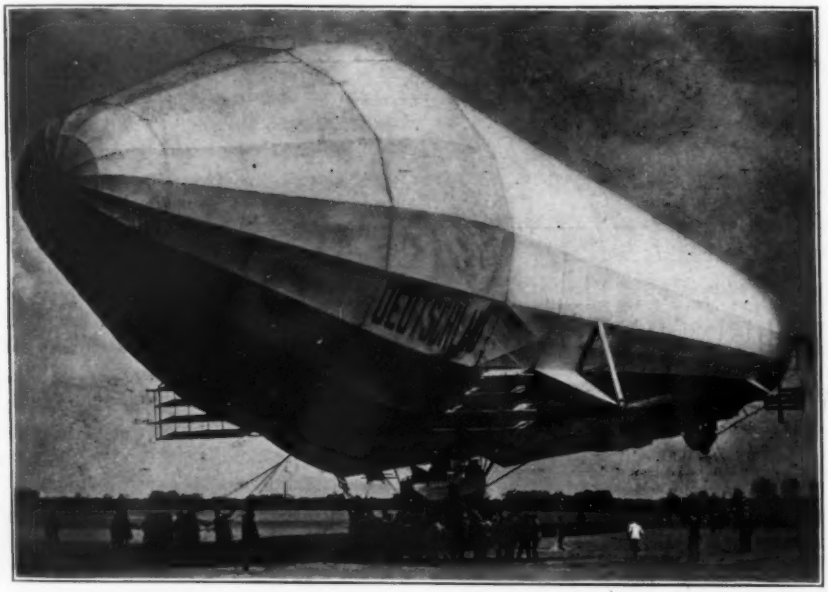
The Palmer bill provides that wool goods shall be deemed misbranded if the correct pecentage of wool is not plainly and correctly stated on the outside of the package, or "if the percentage of shoddy contained in such articles is not correctly stated." Finally the Hon. A. Mitchell Palmer inserts in his bill a section providing "that the Secretary of the Treasury of Commerce and Labor shall make uniform rules and regulations for carrying out the provisions of this Act." A higher law than any that Congress can enact has provided that the Secretary of the Treasury and Secretary of Commerce and Labor shall do nothing of the kind. Shoddy can no more be dstinguished from wool when mixed in wool goods than old gold can be distinguished from new gold when both have been melted and mixed and manufactured into jewelry. The Palmer bill comes into direct conflict with natural law. The

pity is that the Hon. A. Mitchell Palmer did not spend an hour or two in woolen mills and discover that fact.

Cotton Outlets and Inlets

A friend in Germany in a recent letter makes the following interesting reference to Tago cotton and the airship "Deutschland" which is stationed at Duesseldorf:

I am mailing you under separate cover a copy of the Duesseldorf General-Anzliger, which contains an advertisement about shirtings made from German colonial cotton in four different qualities, the names of which are probably derived from the different plantations. This is an advertisement of a large department store, and I believe that one store will take the goods made from the entire German colonial crop. In the same paper you will find an item regarding the trip of the airship which is now stationed at Dusseldorf. About 28,000 square yards of cotton cloth was used in the construction of this airship, which makes a wonderful appearance from my window, sailing above me, the shape of a big ocean steamer, and going much faster than its comrade of the sea. I enclose a few photographs of this airship.



THE AIRSHIP STATIONED AT DUESSELDORF.

One of the photographs to which our correspondent refers is shown in the accompanying illustration. The gigantic size of the airship, as seen in this picture, raises the hope that the cotton cloth required for covering airships may go far toward making up the shrinkage in the orders resulting from the introduction of the hobble skirt. Unfortunately for the textile mills, however, airships, despite the 28,000 square yards of cloth required for each, are too few in number to offer any appreciable compensation for the loss of several yards on every woman's fashionable dress.

The advertisement to which our German correspondent refers is by the Lombard Tietz Co., and calls attention to the strenuous efforts to develop cotton growing in the African colonies of Germany. It states that in order to further this German enterprise and direct public attention to the importance of making the German consumer independent of the American cotton supply, the advertisers have arranged for this extensive sale of cotton goods guaranteed to have been made of real German colonial cotton, which is said to be particularly lustrous and of a quality equal to Egyptian. The Leonhard Tietz Co. are to be congratulated on an advertisement which, while primarily designed to further the great national enter-

prise of German colonial cotton growing, cannot fail to promote the business interests of the firm. The benefit to the business of the firm seems certain, while the prospect of furthering the national project are exceedingly dubious. After years of effort Germany succeeded in producing 4,100 bales of subsidized colonial cotton in 1909. This is scarcely enough to produce the cloth for four hundred airships like the Deutschland, whereas in the same year, 1909, it was found necessary to import into Germany 2,117,100 bales of American cotton in order to provide for the wants of a German population of 60,000,000. While wishing the Lonhard Tietz Co. every success, we venture to suggest that the way to free Germany from dependence on the American cotton crop is to raise raw cotton in Africa, and not to sell the goods in Duesseldorf.

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Crisis in the Italian Cotton Industry

Cotton manufacturing in Italy has experienced a remarkable development in recent years because of the low cost of production which was made possible by a large supply of low-priced labor, cheap water power and proximity to Asiatic markets. These advantages, however, were not sufficient to offset the disadvantage of defective methods of financing the business, and as a result the industry is now in the midst of a serious financial crisis. A serious evil in the Italian cotton industry is the custom of giving long credits to buyers without requiring a settlement by either cash or negotiable paper. The dealers in cotton goods look to the mills not only for a supply of goods, but also for the credit that should be afforded by the banks.

The effect of such a system is seen in the returns of 17 Italian cotton corporations, which are carrying a floating debt of 132,930,000 lire ($25,655,490), as compared with a capital of 113,150,000 lire ($21,837,950), and a reserve of only 5,790,000 lire ($1,117,476), the last named being only 5 per cent. of the capital stock. Several cotton corporations in Italy are trying to obtain new capital, but are prevented by the depression in the industry. Moreover a number of the companies have placed the valuation of their plants so high that a reorganization and reduction of the present capital appear to be unavoidable. Of the 17 corporations mentioned only five declared any dividends in 1910. The depression in the Italian cotton trade has lasted now for two years, and it is the general belief that relief can be obtained only by stopping a large number of spindles. United action in this direction is, however, very difficult to bring about, but if the industry waits until the demand for goods catches up with supply, the depression will probably continue for a long time.

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English Spinners to Grow Cotton

At last the plan so long dicussed by English cotton spinners, to grow cotton in the United States, is about to be carried out by the Fine Spinners and Doublers' Association. This corporation has purchased about 30,000 acres of land in Mississippi, adapted for the growing of long staple cotton. A subsidiary company is to be formed for conducting the American plantation, which it is expected will produce a crop of 20,000 bales. To this extent the Fine Spinners and Doublers' Association will make itself independent of the growers of cotton. An advance in the price of cotton ordinarily increases the profits of the grower and decreases the profits of the spinner. By raising its own cotton the English spinning corporation evidently expects to equalize these conditions and give its stockholders the profits of both the growing and the spinning of cotton. A further advantage that may reasonably be expected is the ability to produce the grade of cotton best adapted to the requirements of the owners. Still another advantage is the improvement in the baling of the cotton, and it is to be hoped that this improvement will be so great as to lead all American cotton growers to abandon the present wasteful and slovenly method of putting cotton up for the market.

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The production of hemp in the Philippines during 1909 was about 1,280,000 bales, while it increased to 1,340,000 in 1910.

The Richmond Convention of the American Cotton Manufacturers' Association.

The fifteenth annual convention of the American Cotton Manufacturers Association was held on Thursday and Friday, May 18th and 19th, at the Hotel Jefferson, Richmond, Va. This was the third time within four years that the association has met in Richmond, which certainly proves the attractions of and desirability of that city for such a large convention, and testifies to the ability of the reception committee of the Chamber of Commerce, as well as to the associations committee of arangements in making the visit a most enjoyable one.

The weather was unseasonably warm, but that did not interfere with the work of the business sessions or the enjoyment of the social features. In point of attendance, both of the manufacturers and the allied interests, the meeting surpassed any previous one. Fully four hundred were present during some portion of the meeting. The number of northern men present was unusually large and with the big Southern delegation gave to the convention the character of a truly national meeting representing all sections of the great cotton manufacturing industry.

The presence of a delegation of a dozen or more cotton planters from Mississippi, as well as growers from other states, cotton factors and brokers, cotton yarn merchants, cotton machinery builders and representatives of all lines of mill equipment, made this meeting one of the most comprehensive gatherings of all branches having to do with the cotton staple that has ever gathered.

If there have been differences between the North and the South on cotton manufacturing questions, both sections of the country now seem to be in accord on the great problems of the day. With few exceptions, the Southern cotton manufacturers are in sympathy with the protective tariff principle, and the tariff committee of fifteen appointed at the meeting will undoubtedy formulate strong resolutions in favor of adequate protection to manufacturers.

The topics chosen for discussion were of keen interest, and the Thursday afternoon session particularly, when the subject of cotton exchange methods was discussed by President Marsh of the New York Cotton Exchange, and Louis W. Parker, chairman of the Committee on Exchange was of the keenest interest and drew to the convention hall a very large attendance in spite of the oppressive heat. The afternoon session, which usually ends at 4.30, was extended to nearly six o'clock, causing a postponement of several of the papers which were to have been presented until the next morning session.

The officers and Board of Governors of the Association arrived in Richmond on Wednesday morning, and conferences of importance on matters of common interest were held between them and some of the officers of the National Association of Cotton Manufacturers including President Franklin W. Hobbs, James R. McColl, Arthur H. Lowe, C. J. H. Woodbury and others. On Wednesday evening a party of about 40 who had come by boat from Boston arrived, and late that night and early the following morning, the southern delegates arrived in large numbers.

On Wednesday evening, President Cooper gave a dinner to about 40 invited guests, including the officers and members of the Board of Governors of the American Cotton Association and the visiting officials of the National Cotton Manufacturers Association, and some others.

At ten o'clock Thursday morning, President Cooper called the convention to order. Prayer was offered by the Rev. Sam'l D. Hatcher of Richmond. He was followed by the Hon. D. C. Richardson, Mayor of Richmond, who welcomed the members and guests to the city. The mayor assured them that their previous visits, first as strangers and then as acquaintances, had now warranted him in calling them friends, and as such entitled to everything that the city could offer in the way of hospitality. He sketched

the growth of Richmond in the last few years, showing that it had not been standing still but was rapidly taking its place among the leading cities of the country from a manufacturing point of view.

Jas. P. Gossett, President of the Williamston Mills, S. C., responded for the Association, thanking the mayor for his cordial welcome and assuring him that past experience had made them aware of the many attractions Richmond possessed.

President Cooper then delivered his annual address.

ELLISON A. SMYTH, ELECTED PRESIDENT OF THE AMERICAN COTTON MANUFACTURERS' ASSOCIATION.

PRESIDENT'S ADDRESS

I greet you most cordially upon this, the fifteenth, annual convention of the American Cotton Manufacturers Association. I feel that special thanks are due to our Board of Governors, and that they are to be heartily congratulated upon their happy selection of this place, which has enabled us to meet amid such pleasant and comfortable surroundings

The beautiful city of Richmond, whose history is that of progress and development, with its live wide-awake, energetic and intelligent business men, its splendid citizenship, its magnificent hotel facilities, has always been noted for its open-hearted and delightful hospitality, and those who enter its gates are made to feel at once the sincerity of its welcome.

There is no place within my knowledge where the evidences of advancement along all lines, and especially in its financial, commercial, industrial and manufacturing enterprises, are more marked and manifest than here. Hence, I am sure that coming together under such favorable circumstances will make this, both in its social and business features, one of the most pleasant and profitable meeetings in the history of our Association.

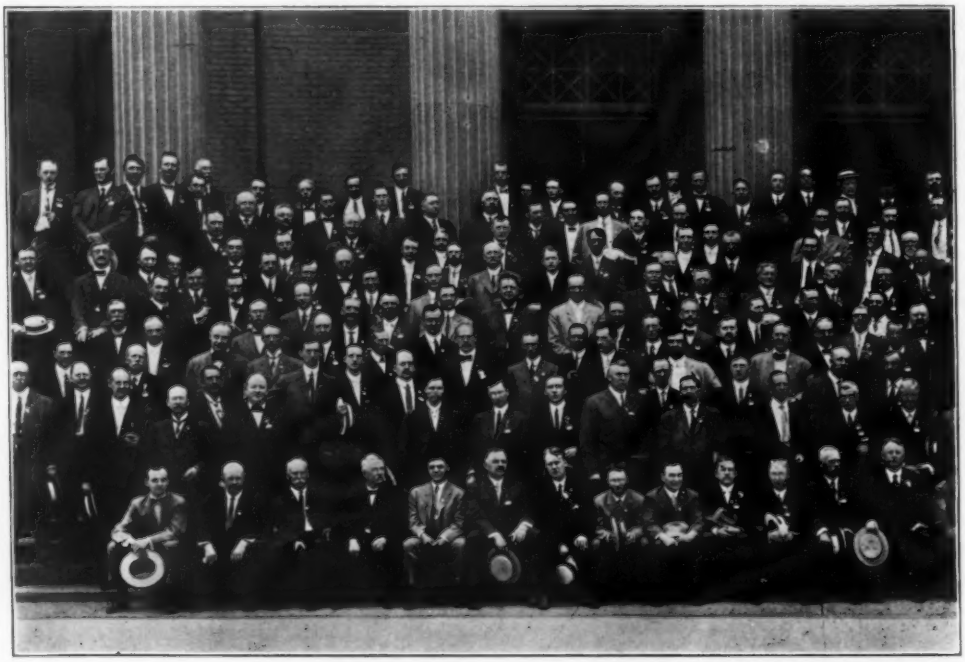
The object in forming this corporation was to extend and encourage investigation and experi-

ment in scientific methods of cotton and textile manufacturing, and to permit social intercourse among persons engaged in cotton manufacturing and allied pursuits. An attractive program has been prepared, embracing many subjects, hence, my purpose is to give only a short outline of what has been undertaken and accomplished during the year. These annual meetings are, and should be of greatest importance to everyone interested in cotton growing and cotton manufacturing. The association has grown from a few in number to a strong organization, having now about twelve hundred members, composed largely of manufacturers and those engaged in kindred pursuits, making a most congenial organization.

The business situation for the past year has not been encouraging. Cotton manufacturing, in its various phases has puzzled the oldest, most skilful and most successful manufacturers. Profit and loss accounts have claimed attention and closest scrutiny. Schemes and plans have been devised for cheapening production, lessening waste and the cost of distribution. Activities along this line may serve us well in the future. Depression in the business has been continuous for the year. Curtailment has been resorted to, but not in a general or co-operative way. Had there been a general curtailment, it would have doubtless relieved in a large measure the situation, preventing much uncertainty and loss. Manufacturers have never economized so closely, and the cost in many instances has been reduced to a minimum. There is a better understanding between buyer and seller. The evils of cancellation have been, to some extent, eliminated. Commercial integrity is getting on a higher plane.

A cordial invitation was extended to your officers and we met with the officers of the National Association of Cotton Manufacturers in New York on October 19, 1910. Notwithstanding the fact that both associations have been in existence for many years, this was their first joint conference. The President, Mr. Franklin W. Hobbs, in opening the conference, stated: "There is so much in common in the purposes of the two organizations here represented by their officers, that it appears as if the interests of the cotton manufacturer would be enhanced by concident, although independent, lines of policy, and such uniformity of action would have the greater force through the logic of numbers." Matters were discussed pertaining to their mutual interests in a friendly manner, exchanging views on various subjects. After a most harmonious conference, we adjourned with the understanding that a call meeting would be held in Washington, D. C., during the early part of the new year, to which the officers of the Farmers Union would be invited.

President Hobbs called the Washington conference to meet February 2, 1911. There was a full attendance from both associations, but for some cause, delegates from the Farmers Union were not present, which was to be regretted. The consensus of opinion of the delegates present was that



COTTON MANUFACTURERS AND THEIR

the interests of the growers, manufacturers and distributors of cotton are so closely identified that they should meet and discuss matters pertaining to the growth, sale and manufacture of cotton in the most open and frank manner. Subjects for discussion were, "Ginning and Baling of Cotton," "Bills of Lading," "Standard Samples," "Buying of Cotton," "Sales Contracts," "Warehouses," and "Forest Conservation.' These subjects were discussed pro and con in a full, intelligent and comprehensive manner.

The forest conservation bill before Congress, which was so strongly urged by both associations

land and Southern manufacturers and growers met for the purpose of co-operation and discussing methods so far-reaching and vital to them all. Acquaintances and friendships have been formed, personally and commercially, which will be of lasting good and pleasure to both associations.

The growth of cotton should and can be controlled by the American farmers, and to this end the Southern farmers should be protected and encouraged to use improved methods of cultivation and to make greater efforts to grow larger and better crops. There are enough lands in the Southern states to grow sufficient cotton for the

GUESTS AT THE RICHMOND CONVENTION.

as a matter of greatest importance, has since been passed.

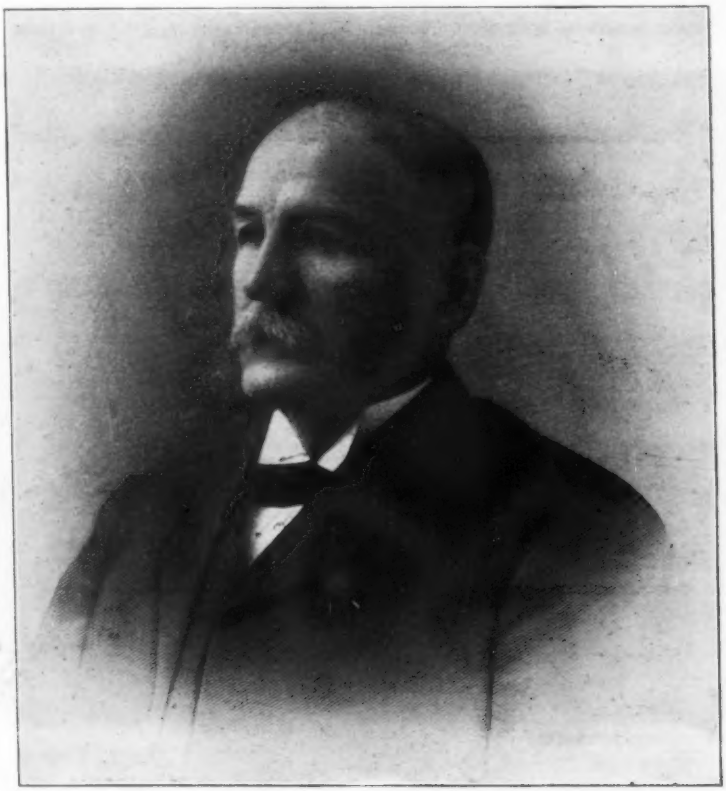
The Presidents of the National Association, the American Cotton Manufacturers Association, and the Arkwright Club were requested to appoint two joint committees, three members from each, to be known as "The Committee on Cotton Exchanges," and "The Committee on Ginning, Baling, Buying, Tare, etc." These committees were requested to take these questions under advisement, and report as soon as practicable the results of their deliberations and conclusions. We hope to have these reports made at this meeting.

I take this occasion to express my appreciation and that of this association to the National Association for the kind and courteous manner in which we were received by them. This joint conference will doubtless be of immense value to both associations. Never before have the New Eng-

world's spindle consumption. The most desirable varieties of cotton known can be grown in larger volume, more advantageously, and with more satisfactory and economic results, than anywhere else. English and continental spinners could experiment along this line with profit, and with a saving of subsidies and heavy expense to themselves and to their governments, when compared with other similar products. Cotton fabrics have never been placed upon their proper basis, nor has their intrinsic value been properly appreciated. They have traditionally been regarded as the poor man's cloth. Yet "no nation and no people has ever reached such a point of civilization or such a stage of development as to have outgrown the use of cotton products." With the immense yearly increased distribution of cotton goods there are millions of people in the world yet unclothed. To meet additional demands, as you will be called up-

on to do as civilization advances, the enlargement of the cotton fields of the South, and improvement of facilities for the manufacture of cotton, will become necessary and imperative. No section of our great country offers more opportunities for development or greater advantages for investment. It is desirable that our foreign trade be more extensive, entering into new fields, and asking for a reasonable share of their valuable trade. Sharp competition, established traditions, trade lars, or twice as much as the output of all the gold mines of the world combined, for the same year. Crops of twelve and one-half to thirteen millions of bales annually are necessary for legitimate demands at remunerative prices to the growers. Less than this amount means manipulated markets and unsatisfactory trade conditions.

The South today is in as much or more danger of losing its supremacy by short crops, abnormally high prices and manipulated markets, than it



D. Y. COOPER, RETIRING PRESIDENT OF THE AMERICAN COTTON MANUFACTURERS' ASSOCIATION.

conditions—low cost of mill equipment and production—and skilled labor are all to be encountered and must be overcome. We must so fortify our position as to be able to prove to our customers that it will be to their advantage to trade with us, and, to that end, only trained agents should be sent to solicit and establish his business, which should be built upon such confidence that it cannot be weakened or overthrown by the strongest competition.

To maintain our proud position as the chief cotton-growing country of the world, and to supply the requirements for American cotton, it is necessary that we increase the growth of cotton. The crop of 1910-1911 will be worth one billion of dol- would be with larger crops at steady, fair and remunerative prices. The former will undoubtedly stimulate its growth in all countries that require cotton for manufacturing purposes. Its growth is being encouraged, by large subsidies and expenditures, in every section of the world where there is hope of its production. On the Pacific coast we are beginning to produce cotton, California alone planting eighteen thousand acres, with an estimated yield of one and one-quarter bales per acre. The American grower should not be contented to stand still and merely hold his present position among the cotton growers of the world, but should bestir himself to keep pace with increasing demands for American cotton.

We are impatiently knocking at the doors of the foreign merchants, seeking trade that is of slow growth, the essential features being friendship, absolute confidence, and longer credits than the American manufacturer is accustomed to give. In fact, the American manufacturer is averse to giving long credit, slow to change his mode of business, or construction of his goods, to meet the requirements of the foreign merchants. The Bureaus of Manufacturing and Agriculture are making strenuous efforts and spending large sums to secure as much of the foreign business for the textile manufacturer as possible. Are we giving them our enthusiastic support? We appreciate also the aid of the Pan-American Union, in their endeavor to secure a liberal share of the South American trade. These combined efforts will benefit the American manufacturer in proportion to the amount of goods marketed abroad, eliminating much of the competition on our home markets. Larger and better markets for the products of the American agriculturists and manufacturers are to be desired, encouraged, and must be secured.

The textile and commercial press have repeatedly warned the cotton manufacturers of the enormous increase of new spindles and the consequent evils of over-production. From time to time, they have covered comparatively the whole field of cotton milling activities, collating and distributing a mass of valuable informaton. There have been more articles of real merit, bearing on this subject, written during the year than ever before. The information gleaned from their columns has been invaluable to both grower and manufacturer. The market journals have given daily full reports of conditions and prices of goods in domestic and foreign markets. The manufacturer of today, by reading the textile and commercial journals can keep in close touch with the rapid changes and methods that are going on in this vast business. It is with pleasure that we express to them our appreciation for their kindly interest.

Notwithstanding this enormous increase of the world's spindles, during the same period, there was a reduction of over two and one-half millions of bales of American cotton produced, for three years, 1907-08-09, as compared with the production of similar periods of 1904-05-06. Yet there was an estimated increase of seven millions of acres in the years 1907-08-09 greater than 1904-05-06. In other words, while the number of spindles and acreage increased enormously, the production of American cotton declined. Climatic conditions enter largely into the yield of the cotton fields. The expansion of the cotton mill industry in the South has been phenomenal within the last twenty-five years. It is not unreasonable to expect that, with increased facilities and more perfect organization, a very much larger expansion will be made within the next twenty-five years, not only in the Southern states, but in the world.

It is estimated that if all the spindles in the South today were operated full time, with cotton at present values, they would produce more than three hundred and fifty to four hundred millions of dollars worth of goods per annum. The commission cost of selling these goods and the burden of these expenses, when aggregated, is something enormous, as compared with the usual risk and services rendered. There seems no escape from this expense, so long as the present methods of distribution continue. The larger corporations, or those who are in position to maintain their selling agencies, find sale for their goods at much less cost than the unorganized and smaller mills. Groups of mills are merging, relieving themselves of expensive management and commissions. A selling agency, owned and operated by a number of mills jointly, would likely accomplish equally as good results. The evil of consigning and receiving advances on products is almost ruinous in its effects, and should receive careful consideration.

The formation of this association is but a verification of the maxim that "In unity there is strength." By meeting together and discussing the various matters that are so vital to our textile manufacturers' interest, we get the benefit of the best thought and experience. The successful continuance of this association is worthy of our best consideration and sincere efforts. Every member should give it his enthusiastic support, to make its activities more progressive and valuable, not only to manufacturers of cotton but alike to the producers, dealers and consumers; the farmer being especially interested, as he occupies the dual position of producer and consumer. He must get fair and remunerative prices for his raw product in order to become a better, more constant and reliable consumer.

In retiring from office as your President, I wish to express my grateful thanks for the great honor you did me, and for the uniform courtesy that I have received from all members. It has been a pleasure to serve you. While we have made progress, I regret it has not been greater. Our Board of Governors by their valuable assistance and kindly cooperation have added much to the usefulness of this association. I express my personal gratitude to our Secretary, who has given so much of his valuable time, and to whose untiring efforts and energy along intelligent and progressive lines this association is largely indebted for its high standard of usefulness. You have been exceedingly fortunate in being able to secure and retain the services of such an efficient, able and skilful officer. His compensation should be in keeping with his valuable services.

In conclusion, permit me to wish for my successor and every member of this association the most abundant success, not only in furtherance of the objects of this association, but in their individual lives and business.

(The Report of the Richmond Convention is Continued on page 416.)

The American Association of Woolen and Worsted Manufacturers.

The fifth semi-annual meeting of this association was held at the Waldorf Astoria, New York, on May 18th. About sixty-five members attended the executive session in the morning, the meeting being called to order by President Frederick Clark at 10.30 o'clock, President Clark said in part:

FREDERICK S. CLARK, PRESIDENT AMERICAN ASSSCIATION OF WOOLEN AND WORSTED MANUFACTURERS.

I regret that the conditions of business in our industry are such as to somewhat interfere with that happy and optimistic state of mind which we like to experience. It is under depressed conditions of trade such as exist today that the abuses which this association was formed to alleviate are liable to be most prevalent, and it is, therefore, all the more desirable that we should come together to renew our allegiance to association policies and to become impressed anew with the fact that the facilities of the association are ample to protect us against these abuses, if we will make use of them.

In addition to our former provisions for investi-

gating and settling claims, we now have the Joint Committee Examiners and the Joint Committee itself, so that members can without hesitation refer their cases and feel assured of careful consideration and just decisions.

Uncertainty as to tariff action and anticipation of radical changes are largely responsible for the unsatisfactory condition in our trade today, but while the present agitation is causing business of a hand to mouth character, I believe there will be no legislation until after the tariff board reports at the regular session of Congress next winter, and that our industry will have ample opportunity to defend itself against drastic and injurious changes.

We have avoided in the past any action as an association in tariff matters, believing that we should devote ourselves to the particular objects for which we were organized and that our interests as affected by national legislation would be best cared for by other associations formed for that purpose. We are especially gratified at this time to note that one of our most valued members, exceptionally well equipped for the position, has recently been chosen president of one of these organizations.

It is a matter of congratulation that the census report, recently made public, has effectually exploded the charge that American goods used by the masses of our people are composed largely of cotton and shoddy. The figures show that while the use of wool has very much increased, that of shoddy and cotton in woolen and worsted goods has decidedly decreased. This is but an indication that a careful, expert investigation, such as we have a right to expect from the tariff board, will show the falsity of the many damaging statements as to wool and woolen manufacturing which have filled the press for a long time.

The session was devoted principally to the discussion of piracy in the wool goods trade, and a number of stirring addresses were made which indicated how thoroughly the trade had been aroused by the practice of pirating styles and fabrics. While no names were given out, it is well understood that several members of the association have been detected in pirating styles and it was to them that the following resolutions adopted at this meeting were directed:

Resolved, That it is the sense of the American Association of Woolen and Worsted Manufacturers that no condition of business or exigency of competition can justify a practice so serious in its consequences and so totally at variance with standards of business honor for which the association stands; and further,

Resolved, First that piracy, as defined by this association, is the putting on the market in the same season fabrics and styles that have been copied so closely from those of a competitor as to be capable of substitution by the purchaser, and further,

Resolved, That the Board of Directors in any future cases which may be presented for its consideration, is hereby authorized by a vote of two-third of the Board to expel a member so offending, or by a vote of a majority, to impose any lesser penalty which in its judgment may be warranted by its evidence.

In the discussion that preceded the adoption of the resolutions a majority of the speakers advocated drastic action in the case of the offending members. More conservative counsels prevailed, however, and by the advice of the association's attorney it was decided not to carry out the original plan of censuring the members who were charged with pirating styles. The association will take up the matter privately with the offending members, to whom the sense of the meeting will be communicated.

By a rising vote the association adopted the following resolution on the death of Henry M. Steel:

Resolved that, In the death of Mr. Henry M. Steel, the manufacturing industry to which we belong, loses one who has been for many years prominently identified with its progress and development. Known as he was to all of us, and associated in business relation with many, it seems fitting at this time that we should give expression to our regret.

Loyal and generous, constant in friendship, kindly of nature, his loss will be felt, not alone by those closest to him in the ties of relationship and association, but as well by a wide circle who recognized in him one who stood for all that was highest in the standards of commercial integrity; therefore,

Be it resolved, That we, the American Association of Woolen and Worsted Manufacturers, take this occasion to convey to his bereaved family, the expression of our sincere sympathy and further,

Be it resolved, That these resolutions be spread upon the minutes of this meeting, and that a copy thereof be sent to the members of Mr. Steel's family and to the press.

George C. Hetzel was elected a director in place of Henry M. Steel deceased.

The second session in the afternoon was devoted to the reading of the following technical papers:

THE POLLUTION OF STREAMS BY MANUFACTURING WASTES

BY WILLIAM S. JOHNSON

Among the many changes in public sentiment which have seriously affected manufacturers within the last few years by no means the least important to those producing liquid wastes is the change in the attitude of the public with reference to the pollution of streams not used as sources of domestic

water supply. This change in sentiment has been reflected in the action of the courts and the legislatures of many states, and has already been a source of great expense to the manufacturers affected.

It was only a few years ago that the streams were considered the great natural drains of the country, and this function of the streams was of little less importance than the furnishing of power and means of transportation. The streams for many years carried their increasing burden of filth until many of them became public nuisances, if not a menace to public health.

The first efforts to remedy this condition of the streams were directed toward preventing the discharge of unpurified domestic sewage into the streams, the primary object being the prevention of possible injury to health. Laws have been passed in many states providing that no domestic sewage shall be discharged into the streams without the approval of some public authority, and the manner in which these laws are administered practically limits the amount of sewage which may be discharged into a stream to the amount which the stream can properly dilute without causing a nuisance, the standard now being the appearance and odor of the water rather than the possible effect on the health of the public.

While the regulation of the discharge of domestic sewage into streams is now almost universal, the discharge of manufacturing wastes into streams not used for water supply purposes has generally been permitted in this country without restraint, and, in fact, has been permitted even in streams from which domestic water supplies have been taken. The importance of the manufacturing interests to the welfare of the country has been recognized by both legislatures and courts, and the plea that the factories would be driven out of the community has been sufficient until recent times to prevent any action which would necessitate the purification of manufacturing wastes.

A few years ago a court in Pennsylvania held that the discharge of water from the coal mines into a stream, although it made the water for miles below unfit for domestic and for many other purposes, was not an improper use, this opinion being rendered evidently on account of the desire to protect the mines which were the most important industry in that part of the state.

THE PUBLIC WELFARE

Now, however, the old principle that, because of the importance to the factories to the welfare of the community, the public should endure with patience any inconvenience or even damage to property caused by the factories no longer obtains, the public comfort and convenience are coming to be recognized more and more both in the legislatures and in the courts. This is clearly indicated by recent legislation and court decisions all over the country.

Probably the most drastic legislation is the act passed by the Massachusetts Legislature in the case of the factories on the Neponset River. Under the provisions of this act the Massachusetts State Board of Health is directed to prevent the entrance or discharge into the Neponset River or its tributaries of any substance which may be injurious to public health or may tend to create a public nuisance. If rigidly enforced, this law will necessitate the purification of the wastes from the paper mills, tanneries and other factories on that stream at an enormous expense, and it is interesting to note that public health is not the only consideration, but it is proposed to prevent the entrance into the stream of anything which will tend to create a public nuisance. The Legislature has recognized the right of the large population in the vicinity of the stream to have a stream which shall not be a nuisance even although the large industries on the stream may be seriously affected.

The most notable court decision relating to the pollution of a stream by manufacturing wastes is that rendered by the Supreme Court of Massachusetts in the case or Percy Parker vs. The American Woolen Co. The finding in this case was to the effect that the defendant should be enjoined from discharging into the stream "any acids, soaps, combinations of soap or of iron, chemicals, scourings, dyestuffs, sewage or any objectionable substances whatever in quantities that noticeably or appreciably affect the purity of the waters when they reach the plaintiff's premises, or render materially less fit for drinking, domestic or other uses at that point than they are when they enter the defendant's premises." An important feature of this case is that it was brought not by the public or by state authorities with a view to preventing danger to public health, or even to prevent a public nuisance, but by the owner of a small factory on the stream below who claimed to be damaged by the pollution of the water.

Another interesting decision is that in the case of Honora McNamara vs. David W. Taft. In this case the owner of a farm on the stream below a satinet factory obtained an injunction restraining the owner of the mill from polluting the brook by wastes from the washers in the mill. The only use made of the water on the farm was for watering three cows, and it was claimed that the discharge of the wastes into the stream made the water unfit for this purpose.

THE DEMAND FOR CLEAN STREAMS

This demand for clean streams is in line with the modern demand for cleaner food and cleaner drinking water. We are no longer satisfied to know that the water supplied to us will not cause a specific disease and that foods we eat do not contain substances injurious to the system. We demand water which is free from filth of all kinds and foods which are clean and free from foreign substances, even though they may be harmless. So it is in the case of streams; the public is beginning to demand something more than protection to health. It requires that the streams shall become, as they will if kept clean, the most attractive features of the neighborhood. It is at the same time becoming better understood that it is possible to have clean streams, even in a region devoted to manufacturing, and that the expense of securing this condition is not such as to drive the manufacturer from the district. In fact, this movement for clean streams is so widespread that the manufacturer would have difficulty in finding a location where he would feel certain that this demand will not arise either now or in the near future.

It is certain that the public demand, enforced as

it has already been by the legislatures and the courts, and the demand of the manufacturers themselves who require clean water in the manufacturing processes, will result in the necessity of keeping out of many of our streams the most objectionable of the manufacturing wastes, and this has become one of the serious problems to be met by the manufacturer.

THE SIMPLEST SOLUTION

The simplest solution of the problem, so far as the manufacturer is concerned, is to make where possible a connection with the public sewers, transferring the problem of the disposal of the wastes to the public authorities, but this method of disposal is, in many cases, impossible and its feasibility in other cases questionable.

In England the Royal Commission on Sewage Disposal reported as follows: "We are, therefore, of opinion that the law should be altered so as to make it the duty of the local authority to provide such sewers as are necessary to carry trade effluent as well as domestic sewage, and that the manufacturers should be given the right, subject to the observance of certain safeguards, to discharge trade effluent into the sewers of the local authority if they wish to do so."

In this country the tendency is rather to prevent the discharge of any considerable quantity of untreated manufacturing wastes into the sewers and to oblige the manufacturer to construct independent works, or at least to treat the wastes so that they will not cause trouble in the sewers or at the disposal works.

LIQUID WASTES

The quantity of liquid wastes produced at a single factory is frequently greater than the total quantity of domestic sewage flowing in the sewers of the town in which the factory is located, and the character of the wastes may be such that they cannot be purified in connection with the sewage, except at a very great increase in the cost. The cost of the sewers and of sewage disposal is largely assessed upon those benefiting by the sewers and in proportion to the benefits received. If a proper portion of the cost should be assessed on the manufacturers, the assessment would be in many cases enormous and enough to make such disposal practically prohibitive. It is difficult, moreover, to determine in advance what the added cost of removing and purifying the manufacturing wastes in connection with the town sewage is likely to be, for it is uncertain how much added expense there will be in purifying the sewage. In some cases the method of treating the sewage must be quite different if the manufacturing wastes are added.

WOOL SCOURING WASTE

A recent example of the effect of the discharge of wool scouring wastes into sewers is found in the experience at Hudson, Mass., where the town sewage was for several years successfully purified by intermittent and filtration. A worsted mill situated on the river and discharging wool scouring wastes directly into the stream was obliged, on account of the protests of a manufacturer on the stream below, to make some other disposition of the wastes, and connection was made with the town sewers and the wool scouring wastes were mixed with the sewage after brief sedimentation. Soon after the wastes were admitted to the sewers the town filter beds became clogged and inoperative, necessitating the disconnection of the worsted mill from the sewers and causing a large expense to the town for the renewal of the filter beds in order to put them into such a condition that they would again purify the town sewage. Similar experience has been made in other places with wool scouring wastes and with wastes from gas plants, yeast factories, creameries and from other manufacturing processes.

Some wastes can undoubtedly be discharged into the sewers without causing trouble, depending on the character of the wastes and their volume as compared with the volume of domestic sewage flowing into the sewers. Other wastes can be discharged into the sewers after some simple preliminary treatment without causing trouble, but in perhaps the majority of cases, where wastes cause trouble in the stream, they are likely to cause trouble in the sewerage system, especially if the sewage is purified.

THE NEED OF CARE

Another reason why in some cases it is not feasible to discharge the manufacturing wastes into the sewers is that the diversion of so large a quantity of water from the stream would bring suits for damage from those on the stream below, and in many cases, like the Neponset River, for instance, where the entire dry weather flow of the stream is used in the manufacturing processes at each of the factories on the stream, the discharge of the wastes into sewers would be impossible. For such cases the only possible way of disposing of the liquid wastes is by discharging them into the streams.

The effect of the discharge of domestic sewage into streams is well understood, and the limits within which such discharge may reasonably be permitted have been fairly well established. The Massachusetts State Board of Health has found that, where the quantity of clear water available for dilution of domestic sewage in a stream exceeds about six cubic feet per second per one thousand persons discharging sewage, objectionable conditions are not likely to result. Under the most favorable circumstances, such as in cases where the sewage is discharged at many outlets into a large body of water, where dilution is accomplished quickly and effectively, objectionable conditions may not result where the dilution is somewhat less than six cubic feet per second per one thousand persons, but objectionable conditions are certain to result where the flow is less than 3.5 cubic feet per second per one thousand persons discharging sewage into the stream.

The dry weather flow of streams in Massachusetts will average from one-fourth to one-third of a cubic foot per second per square mile of watershed, so that, reduced to other terms, objectionable conditions are certain to result where the population discharging sewage directly into a stream is more than from seventy to one hundred per square mile of watershed, and they are not likely to result where the population is less than from forty to fifty per square mile of watershed.

Manufacturing wastes in general differ greatly

from sewage in their effect on the water of a stream, and the study of pollution of streams by domestic sewage is of little assistance in determining what the effect of a given waste will be. The nature of sewage is such that, if it is discharged into a stream containing at all times a sufficient quantity of oxygen, so that putrefaction will not take place and so that it is quickly mixed with the water, it undergoes chemical changes and quickly becomes inocuous. Many of the wastes from manufacturing processes, on the other hand, are quite stable and may be carried for long distances before becoming changed to such an extent as to become unobjectionable.

NO FIXED RULE

No fixed rule can be applied to the amount of manufacturing wastes of any given kind which can be discharged into a stream of a given volume, for the seriousness of the pollution depends on the use to which the water is put even more in the case of manufacturing wastes than in the case of domestic sewage. In fact, the increasing fastidiousness of the public and of users of the water makes any fixed standard out of the question, and each case must be settled independently. Generally, too, the problem is complicated by wastes from other factories, and the responsibility of each manufacturer is difficult to determine.

It must be accepted as a fact that the time is coming when no manufacturing wastes containing any considerable amounts of polluting matters will be permitted to be discharged into the streams of the eastern section of this country, at least, without purification, and the purification must be such as to make the water of the stream unobjectionable to those living near it or resorting to it. Furthermore, the water must be fit for use for manufacturing purposes or for any other reasonable purposes by the riparian owners on the stream below. While this may at first be a hardship to the manufacturer, it will soon work out so that the hardship will in most cases not be noticed, and, of course, if such a rule is universally applied, the cost will eventually be borne by the public which is responsible for the change.

If the wastes are to be purified, it is obviously desirable to reduce, as far as possible, the volume of the wastes, or the quantity of objectionable material to be removed, by separation of those wastes which require purification from those which can safely be discharged into the stream. Many times this can be done without difficulty, and there are cases where it would be economy to make expensive changes in the plant to accomplish the separation of the most polluted water. For example, the quantity of water used for rinsing in cloth washers is many times as great as the quantity of soapy water used for washing, but it is practically clean water and can be discharged into almost any stream without objection. There are cases, too, where valuable stock may be recovered from the wastes before they are purified at a small net cost or even at a profit, preventing to this extent the pollution of the stream or reducing the difficulty of treating the wastes if their purification is necessary. An example of this is found in the save-alls used in paper mills.

WASTE PURIFICATION

The subject of the purification of manufacturing wastes has received comparatively little attention in this country, and the work which has been done in other countries has comparatively little practical value here on account of the great difference in the conditions. The United States Government has carried on investigations and experiments on different classes of wastes, and the Massachusetts State Board of Health has made very valuable experiments with the wastes from certain mills, but the conditions are so different at different factories and the character of the wastes varies so greatly in different mills, even in those producing the same kind of goods, that, while the investigations already made are of value, it is impossible to solve any particular problem by direct application of the results obtained in the comparatively few cases which have been studied.

There is for every liquid waste some means of purification by which it can be improved to such an extent as to make it permissible to discharge it into a stream. In some cases this method of purification is simple and inexpensive; in other cases it is complex and costly, but with our advancing knowledge of the subject of purification, the processes are becoming much less expensive.

Fortunately those wastes which are most expensive to treat are likely to contain substances of enough value so that their recovery will at least reduce somewhat the cost of purification, and this is especially true of the wastes from woolen mills. Every woolen manufacturer has some idea of the great value of the material escaping with his wastes, but he is also probably aware of the great cost of recovering this material by the present methods. Even if it could be recovered at a small profit, the trouble and annoyance of carrying on a grease rendering plant outside of the regular business of the factory might more than offset any profit.

Starting with the proposition, however, that the wastes must be purified whatever the expense, the importance of recovering the by-products, and thus reducing the necessary expense of purification, is evident, for the recovery of the wastes is then undertaken not as a profitable enterprise but as a means of reducing the expense of the necessary purification of the wastes.

In some parts of the world, where factories are close together, companies have been formed which make a business of treating the wastes from the factories. In some cases the company pays the manufacturer a small amount for the privilege of treating his wastes, and recovers whatever is worth recovery from them. In other cases, where the wastes are of less value, or the expense of treating them is greater, the company receives a certain compensation. This company naturally conducts the business of the recovery of the wastes much more profitably than would be possible in the case of a single manufacturer, and he is better able to find or make a market for his product. Furthermore, the manufacturer is relieved of the trouble of maintaining the plant. There seems to be no reason why this cannot be successfully done in many parts of this country and the manufacturer's wastes handled in much the same way as the wastes from meat markets

are now handled, relieving the manufacturer of the troublesome problem of handling his wastes, and at the same time producing a revenue from material which has hitherto gone to waste.

In the foregoing discussion the importance of the recent trend of public opinion and of court and legislative action has been considered from the point of view of the manufacturer producing liquid wastes, but they are perhaps of equal importance to the manufacturer, requiring clean water in the manufacturing processes. Many of the court decisions have been the result of action by manufacturers who claimed to be injured by the discharge of wastes from a factory on the stream above them, and in many cases within the last few years rivers have been made cleaner by the action of manufacturers who have obtained redress without recourse to the courts, peaceful settlements being obtained on account of decisions of the court in other similar cases.

The fact has been established that both riparian owners and the public are entitled to clean water in the streams, and, while to secure this certain manufacturers may in the beginning be put to a considerable expense, the advantages of clean streams to the community and the advantages of clean water to the manufacturers will, on the whole, make the balance on the right side.

ORIGINALITY OF TEXTILE DESIGNING

By MORRIS W. BENJAMIN, of S. Stein & Co.

I approach my subject with diffidence in the presence of men who know how little I know practically of their trade. I have never had any technical training in your line, and while I am familiar with the products of looms, I know very little about processes. I do know this, that many remarkable and unexpected things come off a loom. I have often felt that I could utilize every "mule" in the mill to help me do my kicking.

I appear here in answer to your invitation in much the same spirit as that of Uncle Mose. A gentleman in the Southern town desiring to pay off his cabman found himself short of change, and addressed an old darky who chanced to be standing by with: "Uncle Mose, can you change a five dollar bill for me?" "No," replied Uncle Mose, "I doan' jus' happin to have the change 'bout me now, but I'se tur'bly much 'bliged ter you for de compliment all de same." So if you find that I don't deliver the change, please remember that "I am tur'bly much 'bliged to you for the compliment all the same."

It is not as a practical designer that I presume to address you, but as a woolen buyer who, for nearly thirty years, has been confronted every season with the difficulty of securing that variety and novelty of design and coloring in fabrics for men's wear which his trade demands.

THE AMERICAN MERCHANT TAILOR

The American merchant tailor's wants are very simple. He only wants every season cloths different in style and coloring, and sometimes, but not always, in fabrics, from those that he has had the year before. He wants to be able to impress his customer with the fact that the "correct thing" this season is so entirely different from the "correct thing" of last season that it would never do for a devotee of the "proper thing" in dress to wear his old clothes this year. "There are no birds in last year's suit."

That's what the milliner does, and the dressmaker, the hatter and the haberdasher. Why not the tailor? Now, it is "up to us," the jobbers, to give the merchant tailor what he wants, and it is "up to you," the manufacturer, to supply us with styles and colorings that will immediately be recognized as something new and different. And it is here that the necessity for originality in designing comes in.

I want to make it clear that where I shall use the term "designer" I mean it to be understood in its broadest sense, as including not only the technical man at the mill, but the manufacturer and the selling agent, assuming that, as in most well managed plants, they work in unison in preparing the plan of campaign, as three heads to one body—"like Cerberus, three gentlemen in one." The designer of men's woolens is the man who plans plus the man who executes.

But to return to our mutton—products.

NEW STYLES

When I say that it is obligatory upon the designer to produce new patterns every season, I do not mean that every style shown one season should be a radical departure from all styles shown in the preceding season. Far from that. To the careful observer of fashion's vagaries, and especially to one who is particular to note the styles and colorings upon which the duplicate orders toward the end of a season tend to concentrate, this late demand will give valuable suggestions for part of next season's line.

It is often good judgment on the part of the maker of medium and lower priced fabrics, which can be sold to the wholesale clothing trade, to adopt or adapt the styles that have been shown by a jobber as novelties in higher priced goods the previous season; for it is one of the amiable weaknesses of human nature that a considerable proportion of the men whose means compel them to be satisfied with moderate priced clothes are inclined to ask for something similar to the novel styles they have seen worn the season before by the patrons of the merchant tailor.

If you wear a blue and gold mixture suit today in an exclusive fabric that only the merchant tailor can afford to stock, the odds are that your clerk will be very much interested in a similar coloring, though in an inferior fabric, when the time comes for him to select his suit a year from now.

COPYING A COMPETITOR'S FABRICS

In this connection I think it pertinent to say a few words about a most reprehensible practice that has within the last two seasons reached such alarming proportions as to constitute a serious menace to the trade. I refer to the practice of securing reference samples of a competitor's original and successful novelties and literally copying them in fabrics at a lower price.

Let me give you just one instance from recent actual experience. Among other styles that I purchased from one of the leading fine goods manufacturers was a wide wale worsted requiring (my technical assistant tells me) twenty-four harness,

made in the warp by alternating threads of a beautiful shade of brown worsted and of a white silk twisted around a tan worsted, with the same shade of brown in the filling. About three weeks later a selling agent displayed to me a selling sample which was a copy of this style, absolutely literal in design and colorings, but in a fabric 50 cents per yard lower in price. It struck me that procedure was about on a par ethically with the game of betting on a horse race after one has learned the result by disconnecting and tapping the wires.

This is "designing," it is true, but the word "designing" must here be considered as an adjective rather than as the present participle of a verb. It is not art, but artifice. Every fair-minded man must look on such a procedure as foul play, and may I venture to suggest that it is well within the province of such a representative body as yours to condemn and denounce this practice in no uncertain terms?

NEW DESIGNS

But the original designer will not be satisfied with lazily repeating his own successes or slavishly copying the successes of the past season. He will bring his genius into play and devise new arrangements, new combinations, which, while utilizing the general ideas of design or of coloring, or of both, that have struck the popular fancy, will produce patterns that will immediately be recognized as novel and original. He will see in a sample of a good seller not only the possibilities of developing that idea along the lines that it naturally suggests, but also the potentialities of other designs and other colorings.

When a particular color or a particular class of weaves is in the highest favor, he must be able to make a pretty good guess as to when it will be judicious to stop following the popular taste and try to be a little ahead of the procession when it turns into other paths. For the history of our trade, like the history of all trades that are concerned with catering to the fluctuating whims of fashion, is the history of the periodicity, of style, the recurrence of demand for a fabric, a weave or a range of colorings, that has for a time suffered eclipse, the renaissance of a fashion that was popularly supposed to have been relegated to oblivion, and fortunate is the mill that has connected with it the man who knows how to draw lessons from past experience, and has sufficient foresight to anticipate when the end of the cycle is approaching.

But to be able to develop new successes from assured ones, to know when to stop pushing a good thing along, when to revive the style or coloring that for a time has been sent into limbo, is not enough. There is another requirement for the equipment of a first class original designer, so important that it may well be said to overbalance all others, so self-evident that its possession is assumed in the very statement of the term, but unfortunately so rare that in practice, as a rule, we must of necessity be content either without it, or with a very scant measure of it—I mean that an original designer should be original.

ORIGINAL DESIGNS

Now almost anybody can produce an original design in woolens. You and I have seen many designs that were plainly original, that trumpeted forth the fact that they had "sprung Minerva-like full armored from the brain of Jupiter," and we didn't admire them the least little bit, but because they were unquestionably original. In some cases originality is a disease. No, originality must be mated with sane imagination. That is the chief factor in successful, original designing; and I should not have had the temerity to accept the invitation to address you this afternoon if I didn't feel this truth so strongly, and the desire to proclaim it from the house tops.

The successful, original designer must above all have imagination. He must be endowed by nature with the artictic temperament. He must be a dreamer of dreams and give to airy nothings a fabric and a pattern. He must be able in his mind's eye to conjure up visions of attractive details and gather them into harmonious combinations. He must chase ideals even in the pursuit of so prosaic an end as the invention of new styles in woolens. He may find inspiration in a necktie, a shirting or a piece of tapestry, in the irridescent plumage of a bird or in the sparkling depths of a black opal.

The original designer of woolens for men's wear should be one who has chosen his work in life as a vocation—not an avocation—who has an innate feeling for harmony or design in coloring, to the expression of which in some form he has felt that he must devote his best efforts. Such men, we all know, are rare.

AMERICAN ORIGINALITY

Even in England, where the manufacture of fine woolens has progressed through many generations, and where the development of special aptitude has been encouraged by the foundation of liberally endowed schools of technical design, such a designer is a "rara avis," and he has almost invariably achieved for his mill the very highest measure of success. Time was that we relied upon England for all our designs, and that the copying of English samples was almost the sole resource of the American manufacturer looking for novelty. That was the time, not so long past, when an original designer was not considered necessary in our mills, and when the man who was by courtesy known by this title was in reality only a translator or adaptor, who was required to be able to reproduce a given sample in a different and inferior fabric. We have changed all that now. We have come to realize that American taste is something entirely distinct from English taste and that it will no longer slavishly follow English fashions.

New and attractive designs still come to us from England and Scotland, and when they are new and attractive and appeal to our taste, we appreciate and accept them; but, for example, Picadilly and Pall Mall and Regent St. may be crowded with the wearers of fancy green tweeds without inducing any but the most rabid Anglomaniac to venture upon wearing such a suit on this side. We no longer take whatever England may offer and call it stylish. The most successful dealers in fine imported woolens are those who indicate to the English and Scotch manufacturers what the American trade will want, and have the styles, the col-

orings, and especially the fabrics developed to meet the requirements of American taste.

TEXTILE SCHOOLS

To meet the exacting demands of that same American taste and to keep their trade, our American manufacturers must pay more attention to the development and encouragement of a school of original designers. Proper facilities should be afforded for the training of such of our young men as show a natural affinity for this work, by the liberal support and extension of present institutions, such as the Philadelphia and Lowell Textile Schools. After a sufficient course in school, the designer that is to be should be given an opportunity for practical work in a mill under the sympathetic tutelage calculated to encourage the expression of his individuality.

I have known promising young graduates of the textile school to complain that when they took a job at a mill they were not allowed to express their own ideas, but were compelled to work out the ideas of the boss designer. The original designer is not likely to spring up out of such ground as this. Encourage him to express his individuality. Pay him liberally if he develops originality as a designer. Cheap designers are as foolish an economy as cheap dyestuffs. Salesmen are as plentiful as generals in the Mexican army, and original designers as rare as total abstainers in a fishing club.

We put the effort and emphasis at the wrong end. Put brains and imagination and individuality into the designing of your woolens and they will almost sell themselves, if the fabrics are right. In selecting your designers remember that there are just three watch words that they should always have before them: First, imagination; second, imagination; third, imagination.

ELECTRIC POWER IN MANUFACTURING

By SIDNEY B. PAINE, General Electric Co.

At least 8 per cent. of the total wealth of this country is invested in electrical enterprises (in round numbers ten billion dollars out of a total of one hundred and twenty-five billion dollars). The textile industry employed over 500,000 h. p. in motors, of which the General Electric Company has furnished some 380,000 h. p. Inasmuch as the total power used in all textile mills of all sorts and kinds is 2,000,000 h. p., he showed that fully 25 per cent. of all the power used in the textile mills was by motors. Thus, Lowell has over 30,000 h. p. in motors; Lawrence over 50,000 h. p. in motors: the Pacific Mills, Lawrence, are employing in the cotton and worsted departments over 10,400 h. p., while the Arlington Mills are using over 12,000 h. p. and the Amoskeag Mills in Manchester are employing over 23,000 h. p. in motors. The American Woolen Company uses motors aggregating 28,000 h. p., of which 24,600 h. p. is in Lawrence. The utilization of this form of energy is not confined to New England alone, as North Carolina has 68,000 h. p. and South Carolina 52,000 h. p. in motors alone.

The first textile mill to be driven throughout by motors was installed in Columbia, S. C., and started in April, 1894. It is interesting that not one-half of the motors which have been in use in this mill for seventeen years have required repairs and that on the other half the average repairs will not exceed $50.00 per motor for the entire seventeen years. The first installations were made because of convenience in location. That is to say, the mill and power house would each be located at such a point as to best serve the purpose of power generation and the cloth manufacturer respectively. Water powers hitherto inaccessible were utilized. The advantage of subdivision permitting the measurement of the power consumed on the different machines and the detection of excessive power required on any machine appealed to the early users of this system. All of these and many more which time will prohibit my discussing still hold good today. But it is in other directions that we must look for the reason of the very large increase during recent years. Seven years ago the average sized motor used in textile mills was 75 h. p. while today it is 23 2/3 h. p. This has been brought about largely by the adoption of what is termed the "individual drive," where each machine is driven by its own particular motor. The General Electric Company has furnished for this purpose over 500 motors for pickers, 2,200 for spinning frames and twisters, and about 5,000 motors for looms of various kinds. The chief reason for the adoption of the individual drive is because the manufacturer is able to obtain thereby more uniform and higher speed and consequently greater production and a better quality of product.

A test was recently made in two mills owned by the same manufacturer, spinning the same numbers, using the same grade of cotton, and in other ways as nearly identical as it is possible for two mills to be. One of these mills was driven by group motors of 75 h. p. and 100 h. p. capacity. The other mill was driven by 5 h. p. and 7 1/2 h. p. motors directly connected to the spinning frames. The results were determined not by hank clocks, but by weighing the yarn, and it was found at the end of three weeks the average output of the individually driven frames exceeded the similar frames which were driven by large motors through shafting and belting by 12.8 per cent. The Germans and Swiss are far ahead of Americans in the adoption of varying speed motors on spinning frames. This type of motor permits the change in speed which is automatically controlled by mechanism on the spinning frame so that as the ring rail goes to the bottom of the traverse the speed is reduced and as it rises it is gradually increased. Furthermore, the speed on the entire machine is gradually raised as the bobbin is filled. The limitation as to the speed is not found in the breakage of the yarn if this automatic movement is properly regulated and designed. It is found, rather, in the spindle itself which does not seem in this country to be built for the high speeds which are found abroad.

It is to the looms that we must look for our dividends for if the spinning frames are stopped there is always a surplus of yarn from which to draw in order to keep the looms in operation. The loom lends itself very readily to changes in speed, or rather to the utilization of a higher speed under certain conditions, but the value of

this ability to change the speed is not appreciated by manufacturers.

In almost all woolen and worsted mills there are used what are known as sample looms, on which samples of the proposed fabric are woven before the same is put into regular production. He suggested that these sample looms should each be equipped with a direct current motor so that the maximum speed at which it would be possible to operate the looms when the fabric was manufactured could be determined, thereby securing the maximum production. On a woolen loom running at a speed of 100 r. p. m. weaving cloth counting 35 picks per inch each 1 per cent. change in speed means a difference of 140 yards per loom per year. On the worsted loom running at 120 r. p. m. weaving cloth counting 50 picks per inch, this 1 per cent. variation in speed means a difference of 116 yards per loom per year.

In the early days it was not claimed that the electric motor could operate machinery any faster than the mechanical drive under perfect operating conditions, but these perfect mechanical conditions never existed in a mill. Every belt in a mill slips and oftentimes is allowed to slip until the manufacturer cannot stand it any longer when it is taken up. In the meantime the production has been decreasing in the same ratio as the slip. It is usual in figuring pulleys to allow 3 per cent. for slip on each belt. Again, the torsion of the shafting has a material bearing on the question of speed. Albert Milmow, of South Carolina, recently made some exhaustive tests on this point and in one weave shop found on a shaft 300 feet long the variation at the further end was 6 per cent. greater than it was on the end nearest to the engine. Some manufacturers are careless in regard to the diameter of the pulleys. It is practically impossible to secure pulleys of exactly the same diameter and to drive from these pulleys by belts of the same thickness and acting under the same tension. Some manufacturers endeavor to economize in the width of the belting. The result is a loss in speed in every case. I would be very greatly surprised to learn if in mills driven by mechanical drive or by means of large motors through shafting and belting there would not be found a variation of at least 3 per cent. between the speed of the looms which were supposed to run at the same speed.

The individual drive is positive and has the same effect as if the prime mover, whether waterwheel or engine, was directly and rigidly connected to each machine. This statement is true if allowance has been made for the fact that an induction motor changes its speed slightly under varying loads. On the motors ordinarily used on individually driven looms the power variations would not cause a variation of more than 1 per cent. in the speed of the motor. An improved quality of cloth is also obtained by reason of the more uniform speed. I suggest that when you return to your mills you investigate this question of steadiness of speed in your own weave shops and notice how quickly two looms which were running at first at the same speed would fall out of step. I know of one case in a silk mill where I tested two looms running side by side and these looms stroked together for three minutes without falling out of step.

The inertia of the various working parts of the power driven loom is a factor of great importance in weaving and as the speed and inertia are inseparably connected. It means that the steadiness of the speed at which the loom is driven is of the utmost importance. Each thread of the filling must be driven home into the warp by a definite and equal blow in order that the cloth may be uniform in its texture. As the weight of the blow of the member which drives the filling home varies as the square of the speed it can readily be seen that any change in speed may seriously affect the weight of the blow and consequently the uniformity of the fabric. In one mill recently tested two motors were installed on the looms in the weave shop and ten different samples of cloth were compared with an equal number of samples taken from mechanically driven looms. A photograph was taken which enlarged the texture ten times. The effect was astonishing. The cloth manufactured on the mechanically driven looms varied from 142 to 160 picks per inch, while that manufactured on the motor driven looms varied from 156 to 160 picks.

The individual drive also gives a higher efficiency as a rule than the group drive, especially in the weave shop, as the small motors used for driving looms show an efficiency of 7 to 10 per cent. (varying with the size and speed of the motor) less than that of the large motor which drives the shafting and belting. In a weave shop the loss of power in shafting and belting is considerably over 10 per cent.

Following is a list of those represented at the meeting:

Active—Ashaway Woolen Co., Carolina Mills Co., Clinton Woolen Manufacturing Co., Coronet Worsted Co., Delaine Mills, Inc., W. J. Dickey & Sons, Inc., Dunn Worsted Mills, Earnsdale Worsted Co., Empire Worsted Mills, Georges River Mills, Girard Worsted Co., Greaves Bros., Hadley Mills, Jamestown Worsted Mills, Kent Manufacturing Co., Thomas Kitson & Son, Pawcatuck Woolen Mills, Pequea Mills, Plainfield Woolen Co., Pontoosuc Woolen Manufacturing Co., Charles Porter & Son, A. L. Sayles & Sons, Fred L. Sayles Co., Sayles & Jenks Manufacturing Co., Shelbourne Mills, Strong, Hewat & Co., Talbot Mills, Warren Woolen Co., Waterloo Woolen Manufacturing Co., Webster Woolen Co., Thomas H. Wilson, the Worcester Woolen Mill Co., Worumbo Manufacturing Co., Yorkshire Worsted Mills.

Associate—Allen-Lane Co., David & Rosenthal, L. F. Dommerich & Co., Louis Dusenbury & Co., Inc., William Duval & Co., Charles M. Eakle, Forstmann & Co., John M. Harris & Co., C. A. Heaton, Francis H. Holmes, Lambert Huntington, Innerarity & Kirkaldy, Austin T. Levy, Neale, Maas & Co., Neesen & Slade, Schefer, Schramm & Vogel, W. Stursberg, Schell & Co.

The Annual Meeting of the National Association of Hosiery and Underwear Manufacturers.

The yearly meeting of this important association was held at the Hotel Walton, Broad Street, Philadelphia, on Tuesday, Wednesday and Thursday, May 23d, 24th and 25th, and the program as prearranged was carried out to the letter. The gathering was national in character, as the association contains members from all parts of the country and represents virtually the entire hosiery and underwear industry of the United States.

The exhibition, which was held in conjunction with it and in which were presented the products of many of the largest knitting machine builders, as well as kindred mill supplies, was held in Horticultural Hall, directly opposite the hotel, Broad Street, near Locust, continued the entire week and added much to the importance and interest of the gathering.

Philadelphia is recognized as an important center in the knitting industry, and for that reason the annual gatherings of the association are held there each year.

GARNETT ANDREWS, PRESIDENT NATIONAL ASSOCIATION OF HOSIERY AND UNDERWEAR MANUFACTURERS.

Practical papers of general interest to this trade were read and discussed and other subjects of vital importance, including tariff legislation, high cost of raw materials, the regulation of mill products and subjects of similar importance, together with a series of resolutions, election of officers, comprised the proceedings.

The social function of the gathering consisted of a smoker, which was held at the Hotel Walton, free to all wearing the asso-

ciation badges. This included active and associate members, exhibitors and their representatives, and about 350 participated. The program consisted of a vaudeville performance and refreshments.

The election of officers for the ensuing year were as follows: President, Garnett Andrews, Chattanooga, Tenn.; first vice-president, Chas. E. Leippe, Reading, Pa.; second vice-president, Edward Blood, Sr., Philadelphia; secretary-treasurer, C. B. Carter, Philadelphia; board of directors, John D. Berger, Schuykill Haven, Pa.; William E. Hall, Lowell, Mass.; Joseph Feldenheimer, Philadelphia; J. O. Wells, St. Joseph, Mich.; W. Park Moore, Philadelphia; W. C. Plunkett, Utica, N. Y.

With few exceptions, the above was practically a reelection of the old board of officers, which was a well merited reward for the past year's work well performed.

The following resolutions were adopted:

The resolution committee, Joseph Feldenheimer, chairman, reported the following resolutions, which were unanimously adopted:

Whereas the knitting manufacturers of the United States are confronted with demoralized trade conditions which have limited the sale of their commodities and narrowed margins of profit to a basis where there is little or no remuneration in the manufacture and sale of their goods;

Resolved that the National Association of Hosiery and Underwear Manufacturers in convention assembled, urge upon the knitting manufacturers of the country the importance and the necessity of curtailing production to goods from which they have actual orders in hand.

And be it further resolved that the officers to be elected at this convention do everything within their power to secure the cooperation of not only the members of the National Association of Hosiery and Underwear Manufacturers, but of all other manufacturers of knit goods and thereby secure a more stable business condition.

Whereas, spinners and their representatives have not complied generally in selling cotton yarns upon net weight basis and realizing the saving to the knitters effected through this method of purchasing yarns.

Resolved, that the officers are hereby instructed to begin a prompt and aggressive campaign, not only among the spinners and and their representatives, but also among the knitting manufacturers in impressing upon both seller and buyer the advantages of net weight terms.

Whereas, it is believed much of the uncertainty and depression now prevailing in our industry has been caused by gambling in cotton futures;

Resolved, that the officers of our association are instructed to lend our association's support to any movement now started, or which may be attempted in future to regulate or mitigate this evil.

PRESIDENT'S ADDRESS

GARNETT ANDREWS, Chattanooga, Tenn.

Today the knitter is being confronted with the greatest number of problems—and serious problems—that have ever yet been presented to him. He is in reality fighting for his existence, owing to the seriousness of these conditions. The old-time small knitter of both hosiery and underwear is being confronted with these problems, owing to competition from the larger mills. The organization of the large mills has now begun to tell very seriously in the question of economy, which, beginning with the cost of yarn goes through every department of overhead expense and ends with the selling department, in which cost undoubtedly the large manufacturer has the advantage. During the past year a great many weak mills have been forced out of business, and it is getting so that the man with small capital who desires to start a manufacturing business of hosiery or underwear no longer has the same opportunity for success that he had ten years ago. Owing to the price of yarns, owing to the narrow margins of profit, he has not the same opportunity of starting with a small capital as formerly. Never was competition so keen before in our line of business. Being more conversant with the hosiery end of the business, I can speak more emphatically in making the assertion that we have never yet seen such a revolution in merchandise as has taken place in the past 12 to 18 months. Formerly the man who gave the best value in an article was the manufacturer who primarily gave the best weight. Gauge was not so necessary, though it was an important factor. Today the demand is for the sheerest, gauziest, flimsiest article that can be made to hold together, and the consumer demands not only that this merchandise be made to hold together, but he demands wearing quality, the like of which under the old methods of dyeing was impossible with the heavy-weight article.

Again, take the demand that is increasing continually for silk hosiery. Up to two years ago, who ever heard of a silk hose under $1.50 per pair? Today better values are given at 50 cents per pair,

and there are goods on the market at 25 cents per pair in so-called silk hosiery, being either plated silk thread or spun silk, causing those who are not in the business to wonder how they can be manufactured at a profit. The knitter is constantly forcing the manufacturer of machinery to turn out finer-gauge machines. He is compelling him to use all of the genius at his command in his endeavor to place upon the market something new and something different from his competitor. The hosiery and underwear manufacturer can take a great deal of pride in the fact that not only have they kept their word to the people of this country when they asked for protection on hosiery in the Payne schedule, and instead of increasing our prices the consumer is today getting the best value in hosiery that has ever before been given under any administration and under any circumstances. For appearances, for wearing quality, the consumer today is able to purchase values that up to two years ago would have been simply impossible.

The greatest question that now confronts us is the tariff question. During the 21 months that the Payne law has been in operation a close watch has been maintained on the foreign and landing value of German hosiery; in fact, they say that we have figures covering every transaction through the customs house, and while the German manufacturers of hosiery have reduced the foreign value of their product to some extent, the increase on duty under the Payne law has raised the landing values of the classes which received the increase, much above the values that existed under the Dingley law, thus placing our manufacturers in a much better competitive position, and if the tariff agitation was over it is my opinion American manufacturers of hosiery would have all the business they could attend to.

It is impossible to foretell at this time what our fate will be before the new Ways and Means Committee of the House. Your legislative committee, who have this in charge, will present their facts and will stand upon the merit of their cause. The figures presented by ourselves, we understand, have been corroborated by the investigations made by the tariff board, and, in fact, it has been asserted that we have not really asked for as much as the difference in labor price warrants us in doing. Besides the competition with Germany, we are face to face with the competition of Japan, which has made rapid strides in the knitting of hosiery and underwear and has already captured the Chinese trade and is driving the British and Germans out of the trade in India and Egypt by its cheap merchandise.

The past year, with its high price of raw material and its demoralizing sales market, has been for the most of us a very unprofitable one, possibly the most unprofitable period the business has ever known. It is at such times that our organization proves of some practical value to its members. Until the association was organized, did we ever get yarns on the net-weight basis? Did we ever have continual friction with our customers regarding so-called trade abuses? A great many of these have been smoothed out, and a better understanding today prevails between the jobber and manufacturer than ever before. In looking ahead of us for the next few years I see a fierce struggle for existence. It will be a question of survival of the fittest. These manufacturers who can so organize their business as to turn out better goods and cheaper goods than heretofore will be those who will survive. The haphazard manufacturer who does not know the cost of his goods will not be able to stand the test. The struggle will be a costly one for the survivors. It is not going to be an era of large profits or even of fair profits to some of them except to those manufacturers whose ability to hit upon novelties or styles that will appeal to the public taste and take advantage of them until other competitors begin to imitate them too closely—these will be the only ones whose returns on their investments will be legitimate.

For the immediate future I cannot help but caution my fellow manufacturers to go slow on stocking up merchandise. The market is a falling market. The prospects up to date are for a large cotton crop. This will doubtless drive down the price of yarns, though the yarn manufacturer or spinner is today in as bad a plight as is the knitter and is complaining of lack of profit. Lower prices on cotton on the present selling basis of yarn will give him a larger margin of profit, but will he be able to demand it? Won't he have to give this margin of profit to the knitter, who in turn will give it to the jobber, and the consumer in the end will be benefited?

There is enough machinery ready to be operated in this country, that if put on full time for eight months would supply the requirements of our population for the entire 12 months. Therefore I cannot help to reiterate before closing that the manufacturer who is stocking up merchandise without having orders to cover it is taking a great hazard. Let us hope that the fall will open up more propitiously than the signs now indicate.

SECRETARY-TREASURER'S REPORT

We would state in the beginning that our experience the past year has been no different from that in previous years, in that it has been necessary for the Secretary-Treasurer to visit personally many of our members in different parts of the country to keep their interest and enthusiasm fully alive, and to impress upon manufacturers who had previously withheld their support that a membership in our Association was a valuable asset, and one from which great results would be received.

We have secured 80 active members since our last Annual Convention, and 20 associate members, and we feel this is a remarkably good showing when we realize the marked business depression that has existed not only in our line but in all trades during that period. Your Secretary-Treasurer has spent considerable time in traveling and has obtained excellent results while on the road, but the office work of the Association has increased to such proportion that it is very difficult for him to do as much traveling as is required, and in an effort to remedy this trouble, we have experimented by employing a road man.

We believe that the duties of our traveler may be made to cover the Organization and permanent operation of Sub-Associations. Considerable preliminary work in this direction has already been done, and we feel that much may be accomplished in the future, although we are often discouraged

at the want of interest manifested by many of the manufacturers when these Sub-Association meetings are called. The Pennsylvania underwear manufacturers have made greater progress in the line of Sub-Association work than any other branch of our industry. The question of costs has received special attention, and while it is difficult to estimate the value of this work, yet those attending the meetings have been very highly pleased at these conferences, and we hope substantial results may be realized in the future. In this connection we offer a suggestion that monthly meetings be fixed upon for the Philadelphia manufacturers, and for any out-of-town manufacturers who may have occasion to be in Philadelphia on those dates, same to be held at the Manufacturers' Club, and an inexpensive dinner arranged that would add materially to the interest in the movement and bring about a more cordial feeling among the manufacturers. This is a question, however, that will have to be taken up for consideration later, among the Philadelphia members.

COST FINDING AND EFFICIENCY WORK

The question of cost finding has been given considerable attention practically ever since the Association has been organized, as it was felt that this feature of the manufacturing business, while the most important one, had not been given the attention it deserves and actually requires. Papers have been read at the Annual Conventions discussing this question in a general way, and various plans have been devised in an effort to bring about improved conditions.

NET WEIGHT YARN MOVEMENT

The Net Weight Yarn Movement is moving along quite merrily, as is evidenced by the increasing number of knitting manufacturers who are demanding and receiving net weight terms as well as to the fact that the yarn salesmen are having a strenuous time trying to dodge the issue, but like Caesar's ghost, it will not down. Depressed business conditions are largely responsible for the success of this movement, as the spinner is not nearly so dictatorial and is usually very willing to grant the knitters any reasonable request to induce business and certainly a demand for net weight terms is both equitable and just.

Perhaps the greatest aid to our members in securing net weight terms, and in keeping this question fully alive at all times was the action of the Association in distributing to all members hangers reading: "We are members of the Net Weight Yarn Buyers' Association—a subsidiary organization of the National Association of Hosiery and Underwear Manufacturers. Motto: All Yarn quotations must be made upon a Net Weight basis." These were forwarded about two years ago to all the members, and with very few exceptions each member gave same a prominent space on his office wall, where it would meet the eye of all the yarn salesmen entering. The secretary-treasurer would be pleased to supply members who have joined since that time with one of the hangers, or replace any that have been damaged or misplaced.

The strongest argument that a member may put up to those from whom he purchases his yarns as a basis for Net Weight Terms is a true and accurate record of previous shipment. Show your spinner in plain black and white the shortage (your loss) on every case of yarn received. Evidence of this character will unquestionably wear away any and all objections upon the part of the spinner to granting your demands, and at the same time will give you information of great value.

CREDIT BUREAU DEPARTMENT

Our Credit Bureau Department—now in operation for the past fifteen months—is one line of work successfully performed, of which we are naturally very proud. The developments of the work and the absolutely confidential manner in which same is handled, has completely satisfied the large majority of our members, who are giving their hearty support to this Department. Three rating books have been published and distributed to all members who have qualified themselves as required. We have found that many of the members were not cooperating, because of the fact that they did not fully understand the workings of the plan, but when same was explained to them, they immediately became interested.

Our Collection Department, while not nearly so valuable as the Credit Bureau, is yet a very important feature where the buyer pursues a waiting or belligerent policy. This Department has now been in operation for nearly five years, and the details of same are very simple, as a series of printed blanks are employed in carrying out the plan. These blanks are furnished the members free of cost, and no charge is made on any collections that result therefrom. Over 100 members are using this Department, but the details of same are of such a character that we have been unable to keep a record of the collections that have been made through same.

In concluding my report as Secretary-Treasurer I wish to thank one and all for the many courtesies extended me during the past year. The work and responsibility in connection with the position is increasing very rapidly, and it is my sincere hope that the additional efforts put forth in covering the work as it develops will result profitably to all interested. Your president and other officers, and especially the Executive Committee, have been untiring in their efforts to further the best interests of the Association, and they should receive the sincere thanks of every individual member. Theirs is not any easy task. Plans that sometimes promise successful fulfillment fail in their object, and the tendency is more for criticism than in the way of suggestions as to how they could successfully overcome the difficulties with which they have been confronted. It is very easy to criticise, but difficult to advise. As Secretary, I do not propose to confess any mistakes I may have made. We are all human and liable to err, but surely there is more honor in trying to do something and in failing than in not making any effort to improve conditions. The year's work is before you.

Respectfully submitted,

C. B. CARTER,
Secretary-Treasurer.

EXECUTIVE COMMITTEE'S REPORT

Your Executive Committee, in presenting a report of the Association's activities during the past year, have to confess that in some directions many difficulties have at least for the present proved unsurmountable in accomplishing the ends desired and the results which it should be within the province of the Association to perform. The knitting manufacturers have been compelled to face conditions during the past year on a somewhat different basis than probably have confronted them in all previous years of their experience in the knitting business. Many reasons have been outlined in explanation, but it is doubtful if any one cause can be attributed to the unhealthy condition in regard to the manufacture and distribution of knit goods. There seems to be a spirit of unrest permeating the general public which is reflected very forcibly through the jobbing and retail trade. We assume that the uncertainty of the ultimate results of this period of apathy is forcing the retail trade to limit their purchases to their immediate requirements, and this is reflected in the jobbing trade, as you are all painfully aware. It is very unfortunate indeed that the knitting manufacturers did not earlier realize the trend of the times and discontinue the manufacture of goods on a maximum basis, unless the demand was apparent. Stock accumulations and the press for immediate funds often forced the knitting manufacturers to offer prices upon a ruinous basis, and even then it was difficult for them to relieve themselves of the burden they had assumed. The extremely low prices that were offered by these manufacturers has resulted in a lowering of prices all along the line, and many of us have almost reached the conclusion that the end is not yet.

We fully realize that it is neither within the province of our Association to attempt, nor would it be possible to resolute in any way to produce a revival of general business conditions, and it therefore behooves us to do what we may to prevent further demoralizations in our line. Just what can be accomplished is, of course, problematic, but where there is so much at stake we feel that the best thought of every manufacturer present should be directed towards some concerted action that will have a tendency to eliminate the demoralizing competition, much of which we are of necessity compelled to meet.

In the first place, as has been agitated so frequently by President Andrews during the past year, the most practical step that can be undertaken to improve conditions in the knit goods business is for the manufacturers to curtail productions to accommodate the manufacturer of only sufficient goods for which they have orders. We do not believe any manufacturer present will question the wisdom of such a course, although it may be granted that sometimes a manufacturer may realize a smaller loss by running his plant full and selling at cost or a little under, rather than operate on a profitable basis in a limited way, but manufacturers with such views should look on the other side of the question and consider the possible demoralization that they are not only causing for the present, but also in the future, for it is extremely difficult to raise the basis of prices when once margins have been narrowed. While our efforts in the past to induce material curtailment has not borne the fruits we have hoped and reasonably expected, yet we feel that we should not become discouraged, and that a more earnest endeavor should be made to demonstrate to the manufacturers, not only the wisdom, but the necessity of limiting their production in times like the present.

We have many large and intelligent manufacturers in attendance at this meeting, and we hope they will give expression to their views, as by so doing they may influence other manufacturers of less courage and of manufacturers of smaller volumes of goods.

The second thought we wish to bring to your attention as a means of improving the conditions of the knitting manufacturers is for the Association to pursue a vigorous line of work in the way of impressing upon the manufacturers not only the most of manufacturing but also economies that may be effected through what is generally termed "efficiency work." Theoretically vast economies may be effected through proper installation of efficiency systems. Practically, many of these theories work out successfully, and we wish to present for the consideration of this Covention the proposition of employing, in some advisory capacity, or in whatever way may seem practical, the services of a practical and experienced accountant and efficiency man, who will devote his time, or the greater part of same, to a study of the knit goods manufacturing business with a view of rendering individual manufacturers, or collectively, the benefit of his investigations. Many manufacturers have installed cost accounting systems at a heavy expense, and with proportionate benefits resulting therefrom, and we believe that the reason why other manufacturers have not pursued the same course has been largely owing to the initial expense, and probably to the belief that any kind of a cost system would prove too complicated for economic operation. We believe the Association has now reached the position where we are strong enough in power and influence to render the individual members even greater benefits than have been possible in the past.

We, of course, have not accomplished all the reform that we have had in view, or even that have been attempted; at the same time enough has been performed to demonstrate that the organization is a power for good, and with the past results as a basis and guide there is no reason but that we may accomplish other important measures that must result to the financial welfare of the members of the Association. Fortunately we have steered clear of many complicated questions that either seem to be impractical or that might mitigate disastrously to the Association's progress.

COTTON SPECULATION

One very potent reason which is generally acknowledged as influencing the spirit of unrest which is apparently forcing the jobbers to pursue hand-to-mouth policy is the fluctuating tendencies

of the cotton market. While crop conditions, of course, regulate the price to a considerable extent, yet we think a very large amount of the trouble and uncertainty is caused by speculation-gambling on futures. Whether or not the legislation that is trying to be effected at Washington can correct these troubles or at least eliminate a considerable element of uncertainty will prove effective and result in more permanent values is a question, but it seems to be the consensus of opinion that much good would result therefrom, and we urge that a resolution be passed at this Convention upon this subject, and that our Association should render every assistance within its power to follow up such action as may be agreed upon.

ASSOCIATE MEMBERS

Your Executive Committee is very much gratified over the good results that have materialized through the admission of machinery, yarn and supply houses to the Association as Associate Members. Beyond the benefits the Associate Members are receiving through their connection with the organization in the way of prestige, both socially and in a business way, they are receiving substantial returns through the advertising in the Knit Goods Bulletin and Official Program, and in participation in the Exhibitions that are held each year in connection with the Annual Conventions. Your Executive Committee has also authorized the Secretary-Treasurer to render them special assistance in other directions, from which they are obtaining results of very great value. We have made good progress in this direction, and we ask that every active member of the organization encourage all concerns from whom they purchase machinery, yarn or supplies to join the Association, in case they are not already enrolled.

The continued publication of the Knit Goods Bulletin has proven of material value in increasing the Association's membership and broadening its sphere of usefulness.

One very important step taken by our organization during the past year was that of applying for a charter, as it was the consensus of opinion that such a step would not only strengthen the Association, but also give it an identity and a legal standing that was never possible under the old basis, and at the same time by operating under a charter the individual members would not incur any liability through any action taken by the organization, as would be the case under the co-operative plan, upon which our Association was originally formed.

Perhaps the most gratifying result that has been accomplished this year is that of the Association's ability to pay in full its debts and keep ahead of current expenses. The Secretary-Treasurer has been very successful in making collections from active members, and has succeeded in realizing sufficient net profits from the Official Program and the Exhibition to provide funds for this purpose.

When we consider the business depression prevailing and the unprofitable conditions confronting the knitting manufacturers and those from whom they purchse their supplies, we consider that great results have been achieved, and we look forward to future years of Association prosperity and usefulness that will make a membership in our organization one of honor and of great benefit.

THE DYEING OF HOSIERY

By DR. C. FISCHER and J. H. SHUFORD, New York

There are three distinct groups of dyestuffs in use for producing blacks on cotton hosiery, and these blacks are known as aniline black, sulphur black and diazotizable black. Each has had its own peculiar historic development and each has found its own way into usage under trying difficulties. It is needless to say that the application of each one is well established and is used the world over by dyers and manufacturers of cotton hosiery.

Although we wish to confine ourselves to the description of the dyeing of cotton hosiery with sulphur blacks, and diazotizable or developed blacks, we do not hesitate to say that aniline black still holds its place, and when properly dyed, it is a perfect black both in shade and fastness. We must all acknowledge, however, that in the production of an aged or oxidized black on cotton hosiery, in spite of the best precautions in the ageing chamber, with regard to temperature, ventilation and proper humidity, there is more or less tendering. This tendering is unavoidable, and is the cause of a large amount of seconds and consequently a money loss to the hosiery manufacturer.

WEARING QUALITY WANTED

Within the past five years we have seen the development of a growing and constant demand on the part of the hosiery trade and even the individual for his own personal use, for hosiery possessing better wearing quality. People grew tired of goods that would become full of holes after a day's wear, and the good women folk grew weary of so much darning. Many wideawake hosiery manufacturers were quick to respond to these demands, and began to look around for something better than aniline black. It must be said, to the credit of the ever alive leading dyestuff concerns, that they lost no time in pushing into this new field with their developed blacks and sulphur blacks, offering them as substitutes for aniline black.

Before we go into the discussion of the application of these two groups of dyestuffs on hosiery, it might be well to mention the various types of dyeing machines that are in general use in our hosiery dye houses. For plants of small capacity, or where only a few hundred pounds of hosiery are dyed per day, we find in use the open tub, usually a rectangular vat, built of cypress or white pine, having a false bottom with a suitable steam connection underneath, and a proper water connection. The circulation of the dye liquor is accomplished by poling. The chief types of dyeing machines in use for hosiery dyeing are the rotary and paddle wheel. As a rule, the rotary dyeing machines are constructed of iron, especially when they are to be used for sulphur colors, while the paddle wheel machines are made of wood or iron. The rotary type is built in different sizes, holding from 200 to 450 pounds of hosiery, while the paddle wheel machines hold from 75 to 150 pounds. So far as efficiency is concerned, it is a matter of choice, for satisfactory results are obtained from both types as regards shade and evenness of dyeings.

We do not wish to go into details regarding the proper equipment of a hosiery dye plant, but suffice it to say that there should be plenty of light, room, ventilation and good drainage. The steam supply

should be ample to take care of the boiling vats without any unnecessary loss of time. The water supply should be ample in volume, and too much care cannot be taken to have it pure enough for the character of the dyeing and softening to be done.

Diazotizable, or developed blacks, came into prominence for dyeing hosiery before sulphur blacks, but in not a few instances had to give way to sulphur blacks, because of the latter being simpler to dye, as well as cheaper, but now we observe that they are gradually settling into their own place, being both recommended and used on mercerized hosiery for the reason that the sulphur black bath is harmful to the luster.

The process used in dyeing diazotizable black is somewhat complicated, but when properly executed produce blacks of great beauty and fastness. The dyeing of these blacks requires three different operations, and as many different treatments, and it matters not whether the goods are dyed in the paddle wheel machine, the rotary type or even in an open vat, the goods are handled so much, it is advisable that they be singed after developing.

The first operation, that of dyeing, is carried out like the one used for direct colors. The dye bath can be used continuously, and in the standing kettle a comparatively low percentage of color will be required. The next process the goods are submitted to, after they have been taken out of the dye liquor and rinsed in cold water, is known as the diazotizing process, which consists of a treatment with nitrite of soda and hydrochloric or sulphuric acid. Nitrous acid transforms the color on the fiber to a so-called diazo compound, which enables us to combine the same with the developer. The diazotizing process takes about 15 to 20 minutes, and is carried out in a cold bath. After rinsing again in cold water, the goods are submitted to the last operation, the developing of the color. The developing bath, which is also cold, contains a solution of meta toluylene diamine and soda ash, and the time required for developing is about 20 minutes.

While the dye bath can be used continuously, the diazotizing and developing baths are, as a rule, never used over again. Theoretically, it would be possible, but practically it is never done. The diazotizing bath would not keep very well, especially in a warm climate, and the amount of developer used in the developing bath is too small to bother about a standing bath which would require a special vat or storage tank. The developing process not only increases the fastness of the blacks to washing and acids, but it increases materially the intensity of shade: in fact, it is necessary, in order to develop the shade to a black.

If the diazotizing process is to be done in brass or copper vessels or machines having brass or copper fittings, sulphuric acid should be used and never hydrochloric acid, since the presence of both hydrochloric acid and brass or copper in the diazotizing bath frequently causes streaks and blotches or uneven dyeings. In preparing the diazotizing bath, the sodium nitrite should be first dissolved in cold water, then added to the bath, followed by the acid. It must be borne in mind that the diazo body formed in the diazotizing process is very unstable, hence the bath must be kept cold, 60° to 70° F., being the correct temperature. The diazo body is also very sensitive to light, and should the goods be exposed to direct sun for any length of time, the diazo body will decompose, spoiling the eventual color. For best results, the developing bath should be cold.

The strength of the cotton fiber is not affected in any way, and the finest gauze weights and fancy hosiery can be dyed with developed colors with absolute safety.

The substitution of sulphur blacks for aniline black has almost revolutionized the dyeing of black on cotton hosiery. Because of their simplicity in dyeing, cheapness in cost of dyeing, beauty in shade, extreme fastness to light, washing, their saving of both time and labor in handling and of their filling every requirement for hosiery of good wearing qualities, they have found almost universal favor in the eyes of the dyer and manufacturer of hosiery. Numbers of manufacturers have discarded aniline black, others have diminished its use, while in many plants you will find aniline black, developed black and sulphur black being used. Many hosiery manufacturers have been more or less skeptical and pessimistic about the adaption of sulphur black; some argued that they couldn't get a good finish, others that the shade was poor and the goods were left too harsh in feel, and that sulphur black tendered the goods, and still others said they would not adopt it, claiming if everybody dyed sulphur black the market would soon be clogged with hosiery that would never wear out, and they would be forced to shut up shop. A few manufacturers have tried sulphur black, and prematurely gave it up, principally because of the lack of information regarding a proper working method or the selection of suitable machinery for the dyeing process. It is true that many of the complaints against the use of sulphur blacks, when they were first introduced, were justifiable. But the last decade has seen a most wonderful development towards the perfection of sulphur colors, and, today there are sulphur blacks that can be dyed just as easily as direct colors.

Much has been written and said about the processes of dyeing sulphur black, both from a technical and scientific standpoint in an effort to clear some of the knotty problems of the chemistry involved, but the practical dyer and manufacturer have no special interest in these theoretical points, but are deeply interested in a practical method that will enable them to produce a better and cheaper black than their competitors.

The process involved in dyeing sulphur black is very simple. By the careful observance of a few general laws governing the process, satisfactory results are easily obtained. Hosiery that is to be dyed sulphur black can be singed in the gray or after dyeing; in the event of the latter, it must be dyed before singeing. As a rule, when hosiery is singed in the gray, the goods are dyed, washed thoroughly and soaped before removing from the dyeing machines. It must be borne in mind that a better finish is secured and likewise a fuller shade of black when the goods are aged for at least a day after the dyeing process, then dried, singed and softened.

Sulphur colors must never be dyed in copper vessels on account of the copper being severely at-

tacked by the sulphide of sodium contained in the dye liquor, copper sulphate, a very active oxygen carrier, being formed, causing the dyeings to show up red, or often bronzy spots will appear on the goods, also the dyeings will be less fast to washing and more liable to crock or rub off. Copper is not acted on by the dyed material after being thoroughly washed, and the goods may be hydro-extracted in a copper cage. The function of the sulphide of soda is to dissolve the dye and keep it in solution during the dyeing process. Care should be taken to use the best sodium sulphide on the market, because commercial sulphide, as a rule, has no definite composition, and we have seen bad dyeings traced to the use of a poor grade of this chemical. Rather a high percentage of color, sulphide of soda and common salt or Glauber salt are required in making up a fresh kettle, but these are very materially reduced in establishing a standing kettle, not requiring more than 50 to 60 per cent. of the dyestuff used in the starting kettle. Soda ash is added to the dye bath to help correct the water and to keep it alkaline. Keeping the dye bath alkaline is very necessary in order to prevent decomposition of the sulphur compounds present.

As a rule, soda ash is usually first added to the dye bath, boiled up, then the sulphide of soda, followed by the dyestuff; these are boiled up thoroughly, and then the salt, either common salt or Glauber salt, is added, and the bath is again boiled for a few minutes, long enough to be certain that all the chemicals are thoroughly dissolved. With the dye bath ready, the hosiery can be entered dry. The dyeing is best carried out at about boiling temperature, better results being obtained at just below the boiling point, a temperature of about 195° F. is found very satisfactory.

For hosiery, a continuous boiling is not recommended; we have found in machine dyeing, especially the rotary type, that best results are obtained by boiling from 20 to 30 minutes, then shutting off the steam, continuing the dyeing from 30 to 40 minutes longer in the cooling dye liquor. It is not necessary to continue the dyeing longer than one hour.

After the dyeing, the material should be thoroughly washed as quickly as possible in cold water in order to remove the excess of sulphide of soda. Hot sulphide of soda exposed to the air quickly oxidizes and gives rise to bronzy patches on the dyed material. Also if sulphide of soda is left in the goods, it will slowly oxidize in the presence of air and moisture to acid salts of sulphuric acid, causing more or less tendering of the dyed material on storing. It is our observation that more trouble arises from the insufficient washing of hosiery dyed with sulphur blacks than from any other source. It is often the case that the water supply is inadequate.

In order that successive batches show an even shade and match one another, it is very important that the dye liquor be kept at the same density. The universal method for determining the density of the dye liquor of a standing kettle is by the use of the Twaddle Meter. The proper time to take a Twaddle Meter in same, and if it registers from 3° stock dye liquor for another dyeing. After the dyestuff, soda ash and sulphide of soda have been added and thoroughly dissolved, dip out a pail of boiling liquor, cool it down to 195° F., place the Twaddle Meter in same, and if it registers from 3 to 4°, the liquor is strong enough, and no salt should be added; but if it reads less than 3°, from 5 to 10 per cent. salt should be added. Sulphide of soda is gradually converted to Glauber salt in the dye bath, and helps to keep up the proper density; consequently it is often found unnecessary to add salt for weeks at a time. Another condition that helps materially in maintaining the density is that the same amount of rinse water is added to the stock dye liquor each time from the first rinsing tub. The Twaddle Meter is of no value to show the amount of color left in the dye liquor, and is of no use except for showing the density.

In keeping a standing kettle, the bath sometimes gets "sick," and will not work properly and the black becomes bronzy and red without any apparent cause; in this case the dyer must use his best judgment. The cause of bronzy blacks is invariably due to one of the following three unfavorable conditions of the dye liquor. They are: First, the density has grown too high from the unnecessary addition of salt, or from other sources; second, an insufficient amount of sulphide of soda is being used to keep all the dye in solution; third, the dyeings are not being sufficiently washed in order to remove the excess of sulphide soda. The above causes nine-tenths of all the trouble that is had in dyeing sulphur blacks, but should it so happen that after all these are remedied, poor results are still obtained, the best thing to do is to throw out the old dye liquor and make a fresh kettle.

If the goods are to be singed after dyeing, they are dried in some form of a dryer beforehand. It is very important that the dryer used should be so arranged to insure a perfect circulation of the heated air through the goods to be dried. It is a well established fact that the shades of sulphur blacks undergo a further development during this process, coming out fuller and somewhat redder in shade. This being true, should the temperatrue be very high and unequally distributed, a slight unevenness of shade is the result. This unevenness of shade is partly covered up in the softening bath.

Softening of dyed hosiery is usually done at a temperature from 120° to 130° F., for 15 to 20 minutes. In softening, care should be used to have good pure water. Hard water should be avoided, since hard water consumes soap, forming and depositing on the goods being softened an insoluble soap. One degree of hardness consumes one pound soap per 1,000 gallons of water before any cleaning or softening action takes place.

There are numbers of ready made softeners on the market; the dyer should use his best judgment in selecting the one most suitable for the character of the goods to be softened. The most satisfactory softener is an emulsion of a vegetable oil or a good grade of neutral soap. Care should be taken not to use too large a quantity of the vegetable oil, otherwise the paper bands and boxes will be stained on storing after the hosiery has been boxed.

In dyeing mercerized hosiery with sulphur blacks, it must be borne in mind that the luster is more or less affected by the strong alkalinity of the sulphide bath, and where special stress is put on

maintaining the luster; it is advisable to use diazotizable blacks. In dyeing mercerized hosiery with either developed blacks or sulphur blacks, it is well to note that since mercerized cotton has a much greater affinity for dyestuffs than ordinary cotton, less dyestuff is required in order to get a full shade. As a rule, it will take at from 25 to 30 per cent. less. Care should be taken in the use of salt; too much causes the dyestuff to be absorbed too rapidly, and gives rise to uneven dyeings. It is also advisable to commence dyeing at a low temperature, best results being obtained at below the boil.

The finishing of ordinary cotton hosiery and mercerized cotton hosiery is very much the same. On mercerized hosiery, however, the softening process is frequently omitted. Very often mercerized goods are wanted with a certain amount of silky scroop. For this purpose the goods are treated in a rich soap bath at about 100° F., for a short time. After hydroextracting, the goods are entered in a bath containing some organic acid, like acetic, tartaric, lactric or citric acid. A small addition of tannin sometimes does good work in obtaining a silky scroop.

Silk hosiery has become very popular during the last few years. To dye silk hosiery properly is by no means a simple matter, the process being rather complicated on account of the presence of cotton.

The tops of the goods usually consist of mercerized cotton, and for the heels and toes mercerized cotton splicing is used. The difficult part about the dyeing of goods of this description is to get the two fibers absolutely alike in shade. To select the proper dyestuffs is a matter of the greatest importance.

A good many shades can be dyed very successfully with ordinary direct colors, the same as used for dyeing cotton hosiery. For other shades, mixtures of direct colors and acid colors are more desirable. The colors best adapted for silk hosiery, however, are developed colors. Good results depend a great deal upon the silk used in making these goods, and it is almost impossible to establish a firm rule as to the best way of dyeing silk hosiery. Each individual case has to be worked out separately, and it is up to the manufacturers of dyestuffs to select the colors best adapted for a certain purpose, as their laboratory facilities will enable them to do this in the quickest and most economical way.

PROBLEMS IN SILK DYEING

There are quite a few problems to be solved yet in silk hosiery dyeing. Of late the trade has demanded fast colors, colors that will stand not only washing, but also a fair amount of light exposure. The goods are exposed to the light more or less not only in show windows, but also in wearing. When ordinary direct colors do not suffice, the dyer, as a rule, looks for something better among the developed colors. So far he has limited himself to a few colors of this class, colors suitable for blacks and navy blues only. There are, however, a good many colors of this description at his disposal. Another group of colors that might prove of interest are the after treated colors, especially colors that can be after treated with a diazotized solution of paranitraniline. The shades produced, according to this process, are extremely fast to light and washing. Other colors again will yield very fast shades by a simple after treatment with bichromate of potash and bluestone.

There is also a possibility of using sulphur colors on silk goods when dyed with certain precautions. All these different suggestions might prove very valuable, but so far they have not been looked into sufficiently for this particular line of work.

WEIGHTING OF SILK HOSIERY

Another problem of great importance is the question of the weighting of silk hosiery. The silk yarn used in the knitting process contains a lot of gum, and the goods have to be degummed or boiled off before the dyeing. The boiling off causes a considerable loss of weight, about 25 per cent., sometimes more and sometimes less. The manufacturer wants to make up for this loss in one way or the other. The most natural way would be to proceed in the way the silk dyers do, that is to weight the goods with tin, which, of course, would complicate the dyeing considerably, as it would eliminate a good many colors that would dye ordinary silk very satisfactorily, but not weighted silk. For goods that have been weighted, as suggested above, it would be best to dye the cotton first with a developed color, regardless of the silk, and then crossdye the silk with some fast acid color to match the shade of the cotton.

Before the goods are dyed they have to be boiled off, in order to get rid of the gum, which would act as a sort of resist if left on the silk. The boiling off is carried on, as a rule, in a bath containing about 20 to 25 per cent. green olive soap, and 2 per cent. soda ash. These quantities refer to the weight of the silk in the goods, and not to the gross weight, including the cotton. The soap bath is boiled up well, the goods are entered at about 200° F., and worked in the soap bath for one hour. When the gum has been dissolved, the goods are rinsed first in warm and then in cold water.

As to the dyeing of various groups of colors that come into consideration, there is little to be said that is really new to the hosiery dyer. The direct cotton colors that have been mentioned above are dyed with an addition of Glauber salt, either neutral or slightly alkaline. The goods are entered at about 120° F., and worked at this temperature for 15 to 20 minutes. Then the bath is slowly heated to about 200° F., and the goods worked for another one-half to three-quarters of an hour.

This is simple enough, provided the two fibers, silk and cotton, come out the same. But supposing they cannot be made alike with a simple direct color or a mixture of the same. Very often we find that the silk is lacking in something, especially in depth and brilliancy, and that direct colors will not produce the brightness desired. In such cases an addition of acid colors will greatly facilitate matters and produce results far superior to those dyed with direct colors only. Mixtures of direct colors and acid colors can be dyed in a neutral bath as above, or in some cases with an addition of a little acetic acid, which is to be added toward the latter end of the dye process.

Direct colors, and mixtures of these with acid colors, will be found very satisfactory for light, fancy shades—pinks, sky blues, lavenders, grays, tans, etc. Also for darker shades they are used quite extensively. The fastness of these colors is satisfactory to a moderate degree; in some cases,

however, they show good fastness to both washing and light.

DEVELOPED COLORS FOR FASTNESS

When higher requirements for fastness are made, the develop colors will offer great possibilities. For blacks and navy blues these colors have been used for quite some time. The dyeing is carried out in the same way as mentioned above for direct colors. The process of diazotizing with nitrite of soda and muriatic or sulphuric acid and the developing with M. toluylene diamine, phenylene diamine, B. naphthol, etc., are sufficiently known. The resulting shades possess a very good fastness to washing and light. In some cases it might be desirable to add certain acid colors to the dye bath or to crossdye in a separate bath with some fast acid color, especially for fancy shades, tans, maroons, etc. In fact, it is absolutely necessary on most fancy shades to use acid colors for shading purposes in order to obtain the same shade on both the silk as well as on the cotton.

IMPORTANT DEVELOPED COLORS

The most important developed color is black, and "Brilliant Silk Black B" of the Berlin Aniline Works has established quite a reputation with the hosiery manufacturer on account of its depth and brilliant shade and evenness of tone on both silk and cotton. We might say, there is no better black on the market for silk hosiery today.

Excellent navy blue shades can be obtained with Naphtogene Blue, shades that are well liked on account of their brilliancy as well as on account of their fastness. The dyeing and diazotizing for both the black and the blue are alike. The developing is carried out in different ways, however; while the black is developed with M. toluylene diamine and soda ash, the blue is developed in a solution of B. naphthol in caustic soda. As mentioned above, the group of developed colors offers still further possibilities for tans, maroons, etc. For shades like these the assistance of acid colors will be necessary to some extent.

As to the employment of after-treated colors and sulphur colors for silk hosiery, there is nothing definite to be said at present, as these groups of colors are still under consideration and this is mentioned merely as a suggestion that is liable to promise some practical and valuable results in the near future.

DIFFICULTIES OF DYEING

After having finished the topic of silk dyeing, we would like to glance once more over the dyeing of hosiery in general. The dyeing of cotton hosiery, as well as the dyeing of silk hosiery, or rather the dyeing of mixed cotton and silk hosiery, has certain difficulties that have to be eliminated as much as possible in order to produce perfect results. Evenness of shade is something a good dyer ought to be able to take care of himself, and there is no excuse for it if the goods are turned out full of blotches and streaks. Of course, certain colors will exhaust quicker than others, but, then, a dyer should select colors that exhaust as much alike as possible. We cannot touch here upon the many pitfalls that the dyeing of aniline salt black offers to the inexperienced dyer, and even for an expert dyer there are numerous difficulties he has to contend with. This could be the subject of some other paper, dealing with aniline black exclusively, as the time is too short to go into this matter other than in a superficial way.

SPECIAL DIFFICULTIES APPARENT

Difficulties the manufacturer is mostly confronted by are the so-called oil spots in his goods. These spots are caused through carelessness more than anything else. They originate in the knitting room and are due to machine oil. This is a well-known fact, and we are glad to say this trouble is decreasing continuously. The operators are more careful than they used to be and mineral oils are used less all the time for lubricating knitting machines, since it has been found out that only mineral oils that cannot be saponified are responsible for the difficulty of oil spots.

The dyeing of sulphur colors, especially sulphur blacks, is something that everybody is well acquainted with today, and there is hardly any difficulty in obtaining good and even results right along. If it was not for carelessness that causes troubles occasionally, it would not be necessary to mention it here any further. The carelessness exists, as a rule, in neglecting to twaddle. If the twaddle meter is not consulted sufficiently, the density of the dye liquor is liable to rise beyond the permissible limit and the result is a brownish or a reddish black. That copper or brass lined dye vats or dyeing machines containing copper or brass fittings should be avoided for sulphur colors is something everybody ought to know by this time, but nevertheless is forgotten quite often.

A lot of trouble is caused very frequently by the use of soap in hard water for softening purposes. It is a well-known fact that soap and the lime and magnesia salts causing the hardness of the water are precipitated in form of an insoluble so-called lime soap. In cases where no soft water is to be had, it is well to avoid soap entirely and to use a ready-made softener that can be worked in hard water or else get a water-softening apparatus.

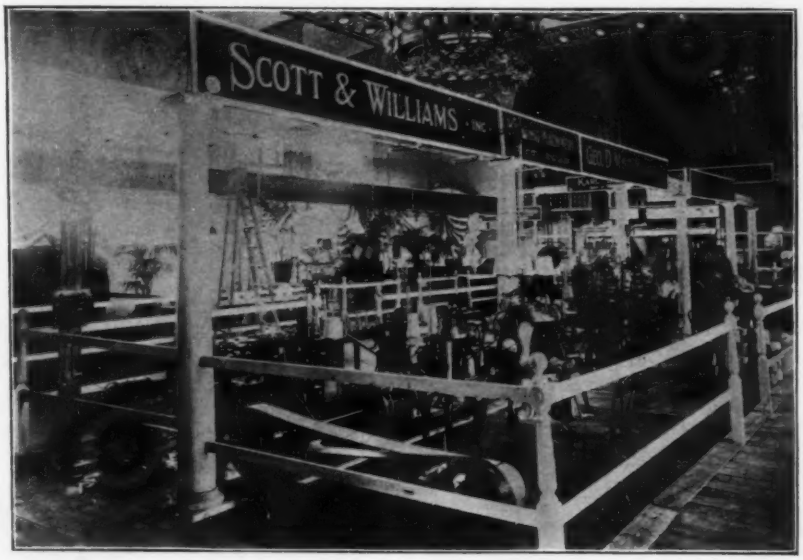
Conditions in the mills varying all the time, it is hard to lay out certain rules for the dyer. It is much better for him to consult the dyestuff house he is doing business with in each individual case. No matter what it is, there is no doubt he will find immediate attention, whether it is a question of bringing out a new line of samples or whether it is a question of solving some problem or straightening out some trouble.

The quantity of raw silk imported into the United States during the last decade increased from 13,583,472 pounds to 24,708,260 pounds, or 82 per cent.

The number of spindles in the silk mills in the United States increased from 1,655,903 in 1899 to 2,405,527 in 1909, or 45 per cent. Of the latter number, 2,275,700 are throwing and 129,827 are spinning spindles. The number of looms increased from 44,430 in 1899 to 75,406 in 1909, or 70 per cent.

The Philadelphia Exhibition of Knitting and Auxiliary Machines, and Supplies.

The machinery exhibited at Horticultural Hall, a detailed description of which follows, was considered a success, and builders of machinery and supplies generally were quite emphatic regarding the favorable and substantial results which they received through the exhibiting of their latest and most up-to-date machinery. The increased number of exhibitors, in many cases in larger spaces than in previous years, was quite noticeable.



SCOTT & WILLIAMS, INC.

Scott & Williams, Inc., and the George D. Mayo Machine Co., exhibited their well known line of machinery jointly, and had on their latest and most improved machines, which they showed for the first time. The Scott & Williams automatic hosiery machine had a new patent automatic combined footer and topper with a new yarn-changing attachment for use in all gauges. The Scott & Williams hosiery ribber was equipped with an automatic speed changer. The new Model B type of Mayo hosiery machines are constructed with the revolving cylinder which adapts it perfectly to yarn-changing and plating. The Model C type which was also shown, is a new machine with the inserted wall cylinder, and equipped for fine gauge work. Their model A machine is the standard Mayo machine with which the trade has long been familiar.

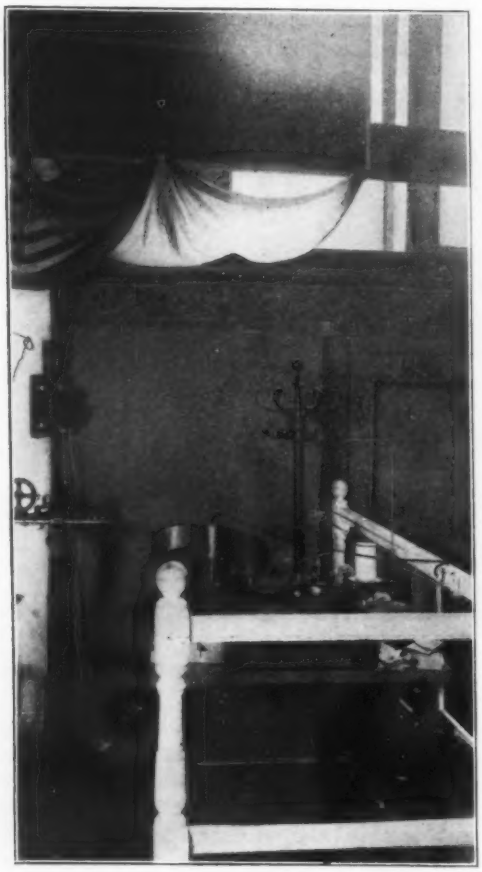
The Continental Latch Needle Co., 120 Liberty St., New York, was represented by E. W. S. Jasper who exhibited samples of the various styles of needles handled by his company. The Continental needles are manufactured by Theodore Groz & Soehne, Ebingen, Germany. This firm was established in 1852 and has a record of fifty-nine years in the manufacture of latch needles. They employ at the present time eight hundred operatives, the products having a high reputation throughout the world.

Thos. Wolstenholme Sons & Co., Frankford Ave. & Westmoreland St., Philadelphia, Pa., manufacturers of fine French and English spun merino yarns had representatives

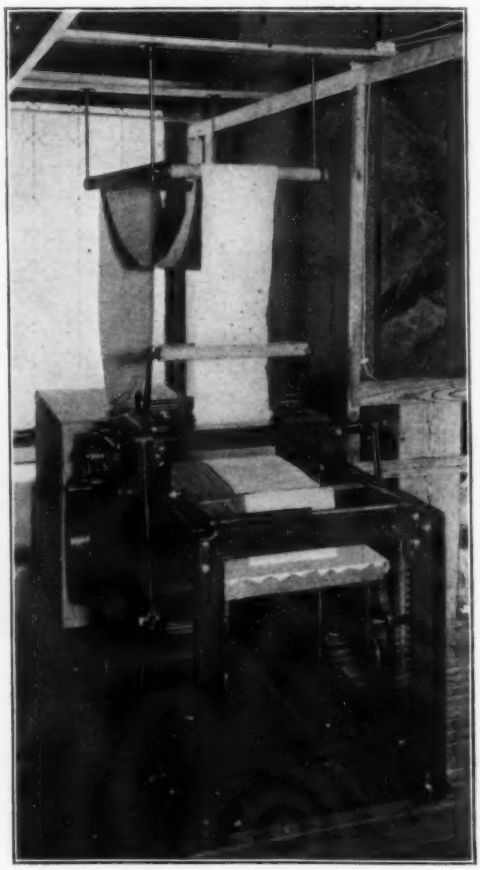
in attendance at the exhibition. Their products are well known and they have an excellent reputation for high grade yarns of uniform quality.

The Aberfoyle Mfg. Co., Chester, Pa., exhibited samples of their mercerized yarn on cones, in combed peeler, Egyptian and Sea Island cotton.

The Grand Rapids Textile Machinery Co., Grand Rapids, Mich., showed the Shields No. 1 web folder in operation. This machine is designed to take the place of the old style of turning and rolling machines, laying the web in flat folds thirty-four inches long. The machine is automatic in every detail, laying the web in flat folds in even lengths, accurate width and even tension.



THE UNION BUTTON SEWING MACHINE CO.



THE GRAND RAPIDS TEXTILE MACHINERY CO.

The Union Button Sewing Machine Co. of Boston exhibited through their Philadelphia representatives, C. E. Hardenbrook & Co., their new improved elastic stitch button sewing machine, which is illustrated and described in another department of this issue.

The Beckert Needle & Supply Co., 4929 Green Street, Germantown, Philadelphia, had an interesting collection of the different makes of both latch and spring needles which this concern represents. This is an imported German needle and is used quite extensively in many of the leading mills in this country.

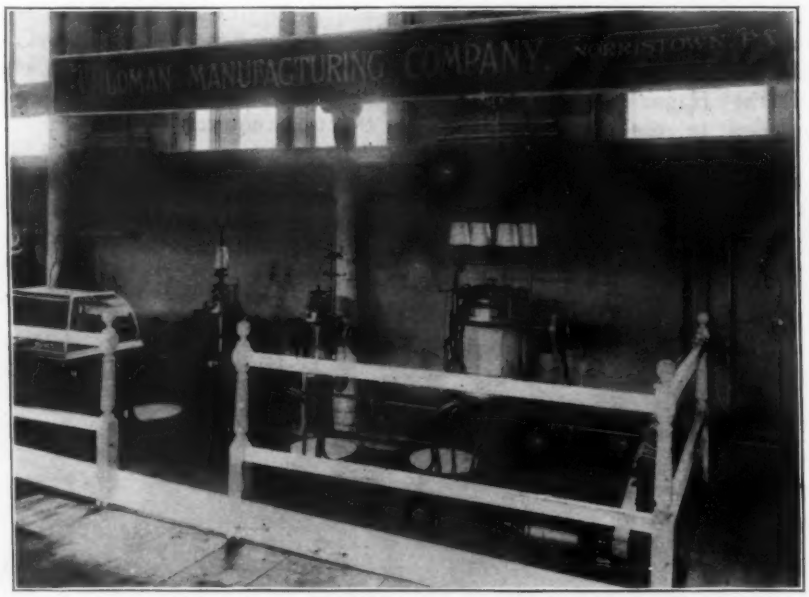
The Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia, had an interesting exhibit of their latest machinery for dyeing, drying, singeing and finishing hosiery, underwear and other textile fabrics. Their "Hurricane" automatic singeing machine, of the Hagar type was of particular interest to the trade. The "Hurricane" drying machinery is of fire proof construction, the exterior panels being composed of a double thickness of steel sheets, with air-cell asbestos between. Rapid and uniform drying of the goods is secured by recirculating large volumes of air over the heating coils located in a compartment at the rear of the dryer, and then over the goods which are placed in racks at the front of the machine. Power screw and hydraulic presses, equipped with hollow steam plates for hot and cold finishing or with solid plates for cold finishing, are provided in a number of different sizes, adapted for hosiery, underwear, dress goods, etc. For dyeing and bleaching hosiery, underwear and skein yarn several different types of machines are offered. In some cases the machines are built of wood, while in other instances it is preferable to use bronze or iron for those parts which are exposed to the different liquors. The Philadelphia Drying Machinery Co. has had many years' experience in these various lines and is prepared to furnish equipments properly designed and of any size to meet the most exacting requirements.

The Cling-Surface Co., 1032 Niagara St., Buffalo, N. Y., exhibited a machine designed to show the increased efficiency derived from belts which have had Cling-Surface treatment over similar belts untreated. The machine was rigged with a treated and untreated belt, running from a single shaft to separate friction brakes, which are arranged with indicators showing the initial tension or tightening strain on the belts and the amount of work the belts are doing. The increased efficiency and physical condition of the belts were at once evident. Cling-Surface, which has been in use in textile mills for fifteen years, is designed to keep transmission belts and ropes pliable, waterproof and in best possible condition, while at the same time preventing slipping. This makes unnecessary the use of tension to stop

THE PHILADELPHIA DRYING MACHINERY CO.

slipping and enables all belts to be run easy or slack and carry full loads.

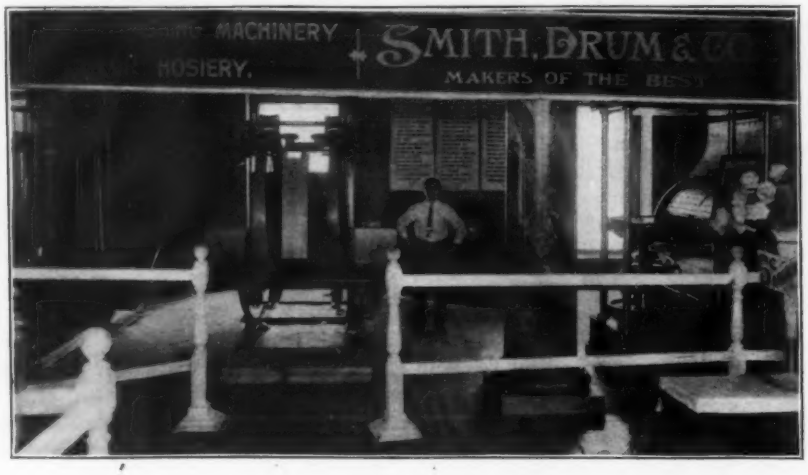
They were also showing their selvage edge machine and 15-inch Swiss ribbed machine.



THE WILDMAN MANUFACTURING CO.

The Wildman Machine Co., Norristown, Pa., were showing in operation one of their

Smith Drum & Co., Philadelphia, exhibited two types of singeing machines, one



SMITH, DRUM & CO

French welt machines equipped with their new speed drive and dogless attachment.

being the revolving pole type, and the other the Hagar type. Both of these machines are

widely used throughout the knitting industry. The hot and cold screw press exhibited by this firm is one of the standard presses of the country. Another feature that proved of interest to the many visitors was their well known rotary machine for sulphur black.

The Universal Winding Company's exhibit included three distinct types of machines, which illustrate some of the varied purposes to which the Universal winding system has been adapted. A No. 50 machine equipped with Nutaper coning attachment was used for exhibition purposes and also to wind yarn for use on knitting machines in the exhibition. As in past years this was found to be a matter of great convenience to the exhibitors of knitting machinery where they desired to do any special class of work and needed the yarn to be wound in perfect condition. The second machine was a No. 50 equipped for doubling fine yarn. Within the past three years this system of doubling has been adopted by leading manufacturers of fine yarn, especially when the yarn is to be used for thread for mercerizing processes. The uniformity with which the yarn is wound on the packing insures a twisted ply yarn containing the highest strength obtainable, and the greatest unifomity of twist. As any imperfection in the single yarns can be removed in the process of winding, the result in finished thread or mercerized yarn is so superior as to create a wide demand for this machine. The third machine is a small illustration of the No. 90 quilling machine, which has become so popular in the silk and cotton industry. As the No. 90 machine adds materially to loom efficiency, improves the quality of th fabric and eliminates nearly all the yarn waste, it is being favorably considered by a large number of the prominent manufacturers, who are steadily adding to their equipment. Several mills already have a complete installation, taking care of all of their filling. A fine display of mercerized yarn on cones, as well as other illustrations of the Universal art, formed a very attractive feature of the exhibit.

THE UNIVERSAL WINDING CO.

The O. F. Zurn Co., Philadelphia, Pa., exhibited their complete line of cotton and silk

softeners, and other specialties for the hosiery and knit goods trade in general. John M. Zurn, president of the company was in attendance at the exhibition.

Kalle & Co., manufacturers of aniline colors, showed one of the real novelties of the exhibition. It was a line of college hosiery, silk and cotton, dyed in two colors,

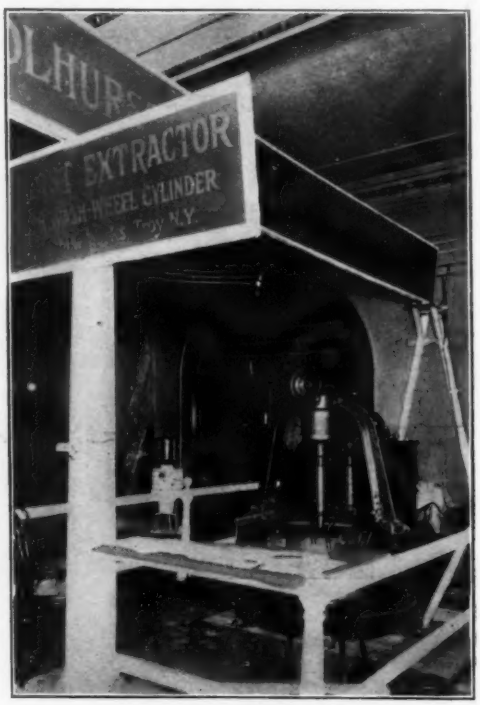
KALLE & CO.

the silk one color, the cotton another, and representing the colors of the larger colleges and universities. The display attracted a great deal of attention, and elicited very favorable comment. Many novelty effects as well as a complete line of standard shades, were included in the display. The underwear show was very attractive, including the well known "Porosknit" and other garments dyed exclusively with Fast Mock Egyptians. There was also a line of all wool and union underwear. Morris F. Schmidt, manager of the Philadelphia office, and Elvin H. Killheffer, New York, were in charge of the exhibit.

The Tolhurst Machine Works showed one of their improved 40-inch motor driven extractors in operation. One of the features of this extractor was its self-balancing principle, which made it impossible for the machine to vibrate.

W. T. Lane & Bro., Poughkeepsie, N. Y., showed a full line of mill baskets and truck constructed of canvas in various sizes and different styles.

The Barber & Colman Co., Boston, Mass., exhibited their latest "Barber" knotter es-



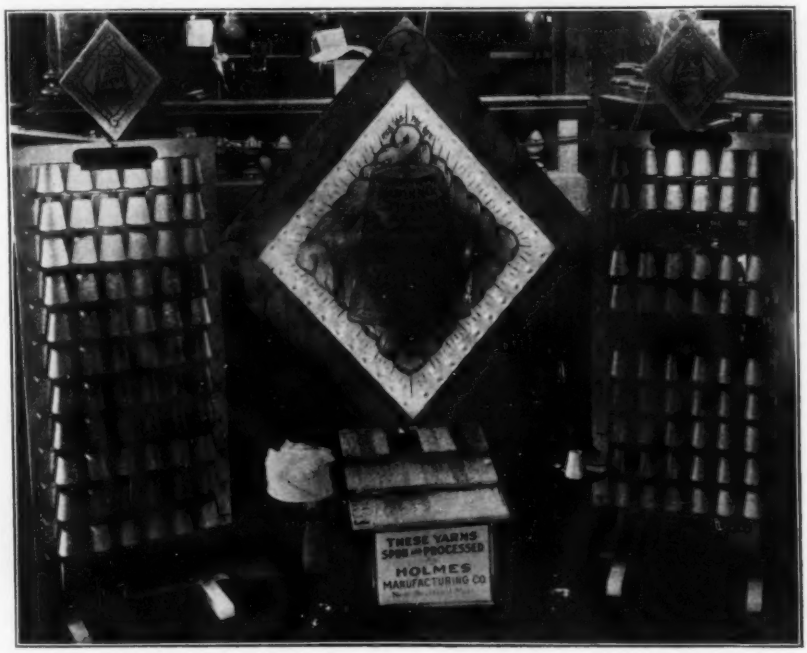
THE TOLHURST MACHINE WORKS.

pecially constructed for all makes of winders for knitting mills. It was the center of much interest during the entire exhibition.

The Kilburn Manufacturing Corporation, New Brunswick, N. J., had in operation their new automatic topping machine in a 176-needle gauge, for mechanically transferring the slack course stitches of hosiery rib tops to the quills of transfer cups and cutting the ribs apart with precision, leaving them transferred and ready for raveling. This machine

is one of the new features shown at the exhibition and it attracted a large amount of attention.

Harding, Tilton & Co. had a very extensive line of mercerized and processed yarns on exhibition. On one side of the enclosure were the products of the Holmes Mfg. Company, and on the other side the products of the Nyanza Mills. The selling force of the firm were in charge. Mr. Harding and several of the agents and treasurers of the mills were also in attendance.



HARDING, TILTON & CO.

The Moore Light Company had an exhibition of the White Moore Light for color matching purposes. This "window" has been adopted as a color matching instrument in a number of large color mills as a standard of average daylight. By its use the working day is lengthened materially, even permitting of an all night shift. The Light is also sold in long tube forms, in which the glass tubing is often one hundred feet in length. The White Moore Light in this shape is recommended for use in dye houses, store rooms, inspection and designing rooms for the illumination of looms where delicate shades of fabric are woven, and in fact wherever color values are of importance.

Harding & Fancourt, Inc., of Philadelphia, had an especially interesting exhibit, which included a full line of softeners, soaps, olive oil, soluble and turkey red oils, German castor oil soap, caustic soda,and other products pertaining to the dyeing, bleaching and finishing of hosiery and underwear. Their Tuscan Softener is well known in the hosiery trade for softening and finishing fast blacks, imparting to the finished product a brilliant luster and soft finish. Their Cream Olive Softener is meeting with increasing sale with both the underwear and hosiery manufacturers. This is unsurpassed for softening as it is a pure white article and will not stain or color the goods. The "Tuscany Brand" of green olive soap, manufactured by this concern, is especially recommended for silk dyeing, being absolutely neutral and made from the highest grade of Tuscan olive oil. In silk dyeing only the best should be used and quality and not price should be the deciding

factor. The Ricinol or German oil soaps is especially recommended to use in place of Turkey red oil and soaps of similar character, it being highly concentrated very little of this soap is required to obtain results. Used in dyeing or printing it gives excellent results, produces more even shades, exhausts the dye bath and leaves the goods in an extremely soft condition.

turers. The "Pearl Stitch" machine, giving a nice imitation of the hand knit stitch, was also in operation, with a good knitter working it. A large variety of designs illustrated the application to the different articles in the infants' and sporting goods' line.

J. L. Shoemaker & Co., 15 South Sixth St., Philadelphia, repeated their exhibition of last year by displaying the New Jersey

GROSSER KNITTING MACHINE CO.

The Grosser Knitting Machine Co., 260 West Broadway, New York, had a very striking exhibit of their knitting machines. Max Nydegger, their American representative, was in charge, the exhibit including the following: The Koehler diamond seamers, the Ideal seamers, the Record loopers; also a number of other finishing machines for the hosiery and underwear trade. In addition there was in operation a full automatic Grosser power machine of the double lock type, fashioning automatically, which will turn out sweater sleeves, properly shaped, in string work. This machine embodies the latest improvements made in the construction of full automatic knitting machines of the latch needle type, and attracted much attention, particularly from the sweater manufac-

textile wire stitcher for attaching labels to hosiery, etc. A large number of these machines have been sold to the knitting trade.

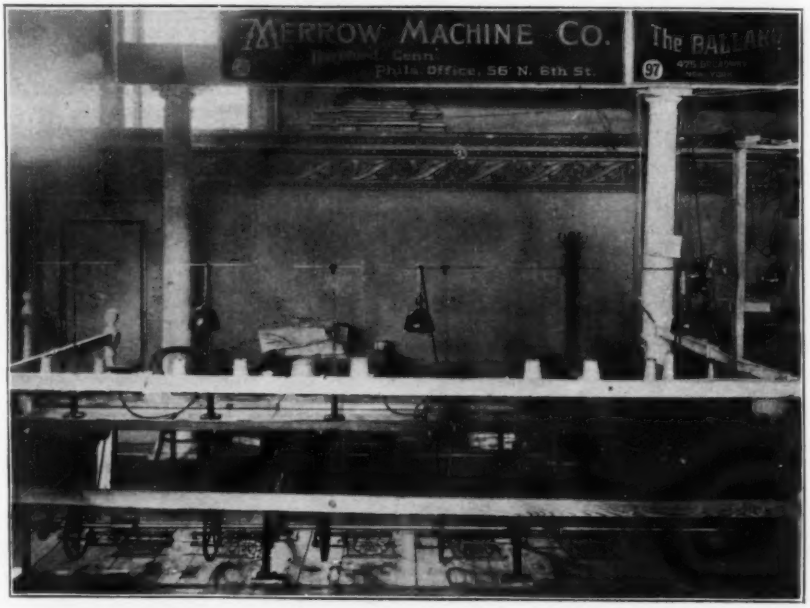
The Rossmassler-Bonine Electric Co., Philadelphia, Pa., exhibited a line of small direct current motors. These motors were substantial in design, attractive in appearance and of high efficiency.

The Manufacturers' Supply Co., Philadelphia, Pa., showed samples of the Excelsior Needle Co.'s well known standard brand of latch needles, as well as looping, seaming and sewing machine needles, and a line of belting, belt hooks, etc.

Edwin A. Newton, Philadelphia, Pa., exhibited a number of knitting mill necessities. Because of the wide line of machinery that

he handles, he found it hard to exhibit them all.

The Merrow Machine Co., Hartford, Conn., showed a line of their various makes of sewing machines, including a new machine for sewing the welt on hosiery and for producing all kinds of fancy stitches for finishing underwear.



THE MERROW MACHINE CO.

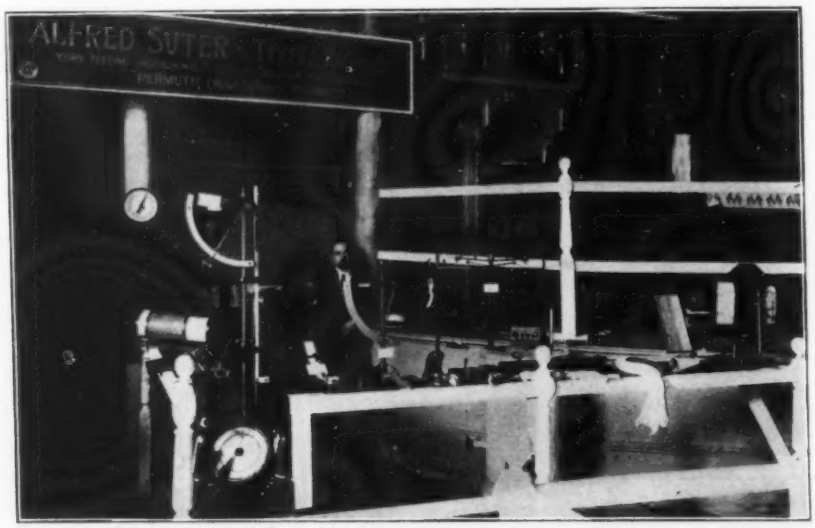
The Standard Machine Company had on exhibition in a very much larger space than ever previously occupied, 240 needle, 3 3/4 inch, and 220 needle, 3 3/4 inch, machines for making ladies' and half-hose, with all the latest improvements, including garter top, loose welt, automatic transfer adjuster, double sole, high spliced angle attachments, and also automatic transfer adjuster for half-hose. There was also a 176 needle, 3 1/2 inch, machine for making misses' ribbed goods, doubling every stitch. These machines were all equipped with the latest model 10 splicing device for handling any combinations of yarns used in the hosiery trade. The exhibition was in charge of Jacob Bauer, general manager, assisted by Chas. L. Schoneman, Western and foreign representative, and P. R. Rahm, Southern representative.

THE STANDARD MACHINE CO.

The U. S. Truck & Mill Supply Co., Bourse Bldg., Philadelphia, showed a line of "Hercules" trucks, an improvement over the

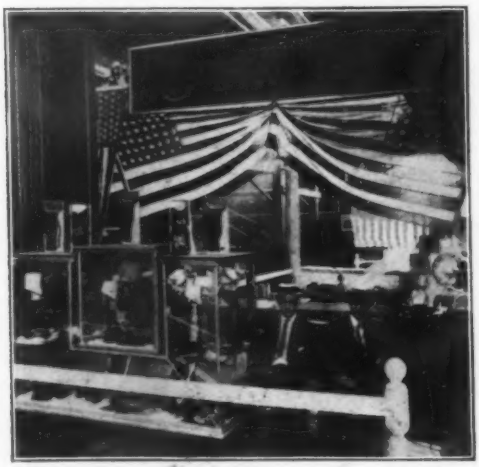
old method of handling goods with trucks, which met with great favor among the many who stopped to examine them.

Yarn sizing scales of various types. Yarn eveness controllers. Yarn sizing reel and an improved speed measurer. Mr. Suter also



ALFRED SUTER'S EXHIBIT.

Alfred Suter, the textile engineer of 487 Broadway, New York City, exhibited yarn testing instruments. His space was

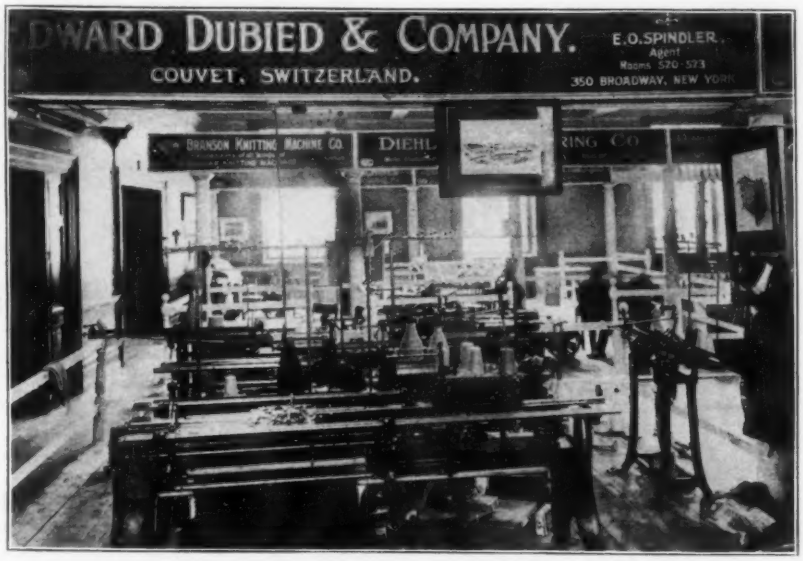


THE BERLIN ANILINE WORKS.

next to the stage in the grand hall on the second floor. These testers included the following: Single yarn tester, with automatic action. Single and double twist measurers. exhibited and demonstrated the Billeter calculating disks and cylinders, used in a large number of mills, factories, etc., to figure prices, wages, consumption of coal and steam, amount of yarn to be dyed for a certain number of garments, amount of yarn per garment, and for many other calculations. Another practically new device in this country, though already in use by several mills, which Mr. Suter spoke about to manufacturers and dyers of knit wear, was the "Permutit" water softening device and apparatus. This Permutit process is guaranteed to reduce any water to absolute softness, both as to temporary and to permanent hardness. No soda nor lye have to be added to the water to obtain this result. Mr. Suter also exhibited samples of schappe yarns (spun silk) as made by J. Willard & Co. of Lyons, and of the cotton yarns as made by the Lorze Spinning Mills, of Baar, Switzerland.

The Berlin Aniline Works exhibited a full line of cotton and silk hosiery dyed with the well-known products of this concern. Black, the most important color for the hosiery manufacturer, was one of the main features.

Zambesi Black, with its bloomy tone, was found by many visitors to be the "Black par excellence" for the highest grade of goods, especially mercerized cotton and silk hosiery. The mercerized goods dyed with this black show a luster that can be equaled only by silk goods. The mercerized cotton splicing in silk hosiery looks like real silk, the threads of both fibers being exactly alike in shade, make the goods perfect in construction and finish. Sulphur Black in its latest shades resembling the highest standards of Aniline. Salt-oxidation Blacks were displayed on both the finest grade of cotton hosiery as well as on a cheaper line of goods. Besides black, there was an imposing array of fancy shades on both mercerized cotton and silk hosiery, which offered valuable suggestions to the manufacturer and buyer.



EDWARD DUBIED & CO., E. O. SPINDLER, AGENT.

E. O. Spindler, 350 Broadway, New York, N. Y., the representative of Edward Dubied & Co., Couvet, Switzerland, manufacturers of flat knitting machines, exhibited several "Dubied" full automatic, power and hand knitting machines. The full automatic power knitting machines have a very novel feature, namely, the patent return counter, an attachment which eliminates all long chains on power knitting machines, no matter how many racking courses are desired in one garment. The machines on exhibition are of the following types: Type VD. Full automatic power knitting machine, single lock, with all the latest improvements. Type VV. Full automatic power knitting machine, double lock. This machine is known for its high production. Type SAA. Pearl stitch links and links hand machine, for knitting pearl stitch articles, such as infants' leggings, booties, carriage covers, etc. This is a new type of machine, and will be of interest to every knit goods manufacturer. Type I. Double lock hand machine for manufacturing knit neckties. This machine is also a new type. Type G. Hand knitting machine with striping attachment. The "Dubied" exhibition was one of the most attractive features of the exhibition. Several demonstrators were in attendance.

The New York Revolving Portable Elevator Co., with headquarters at 349 Garfield Ave., Jersey City, N. J., exhibited one of their latest and most improved machines, which was the center of attraction a great deal during the exhibition. This "Revolvator" has been adopted by the United States and has already found its way into a

great many representative textile mills of the country. They were located on the first floor.

The J. B. Ford Company manufacturers of textile sodas and concentrated ash for textile purposes, exhibited silk yarns on skeins from the Sauquoit Silk Co.; mercerized yarns from L. B. Luithlen and samples of yarns from Thomas E. Brown & Sons, showing results obtained from the use of the piece goods were also a part of the exhibit showing an absolutely white bleach which they guarantee will not turn yellow, the bleach being obtained by the use of concentrated ash in kier boiling, and Wyandotte soda being used in conjunction with chloride of lime. The exhibit was under the management of F. S. Klebart, who is so well known to the trade as manager of the textile department of this company. Mr. Klebart had

THE J. B. FORD COMPANY.

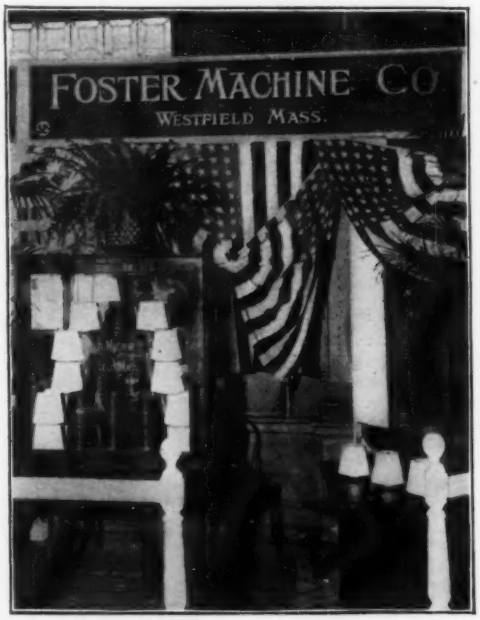
"Wyandotte" textile soda in the boiling out process preparatory to mercerizing; also a line of hosiery from the Reliable Knitting Mills, dyed in sulphur colors, the soda being used in dyeing, producing elegant shades and a soft feel; a line of hosiery from the Lasher Hosiery Mills of Bennington, the goods being washed with textile soda with the result that stains, where two or more colors were used were prevented. They also showed a full line of fine silk hosiery manufactured by the United States Silk Knitting Mills, these goods being degummed by the use of Wyandotte soda by which process the most delicate shades were produced. Cotton

with him able and intelligent assistants who helped materially in showing their goods to the exhbitors.

The exhibit by the General Machine Works, York, Pa., was the center of an interested throng throughout the entire exhibition. The attraction was one of their latest single feed ribbers with the up-to-date compact positive stop motion. One of the amusing incidents was the attempts of the friends of the company to make the stop motion "miss fire" unknown to the attendants. It was the pleasure of those in charge to welcome to the exhibit many of the friends and users of the products of this company. The

decorations of the booth were the cardboard men's hose with large aluminum figures designating the number of the booth.

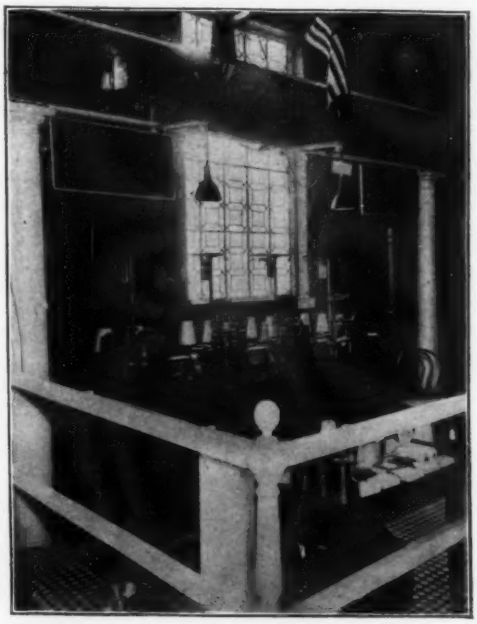
The Foster Machine Co., Westfield, Mass., displayed samples of their Model 12 cone winder, showing the progress made in the art in recent years and what this company have accomplished towards bettering the knitting industry by providing a perfect knitting package. Much interest was shown in



THE FOSTER MACHINE CO.

the Foster differential wind, showing the new taper and absence of ribbon-wind. The advantages of the Foster wind were explained to visitors by T. E. Connor, who was in charge. E. T. Fowler, the general manager of the company, was also present several days.

The Union Special Machine Company, 300 W. Kinzie St., Chicago, Ill., exhibited a new machine built for seaming selvage edged fabrics, principally for fashioned stockings and underwear. The machine is one of the few which this company have at very great expense in order to demonstrate the merits of the machine. So far they have had very flattering recommendations for this machine from the manufacturers where it has been shown. The exhibit included a machine for trimming insertion, producing the same effect as the hand work in trimming Swiss vests. This machine inserts the tape without passing it over and under the cross bars of the lace. This has the effect of bringing the cross bars much closer together and closely imitates the Swiss effect, which has been so much desired, but which heretofore has been accomplished by hand.



THE HEMPHILL MFG. CO.

The Hemphill Manufacturing Co., Pawtucket, R. I., manufacturers of the widey and favorably known "Banner Machine," exhibited four machines in operation during the exhibition. Three machines were on ladies' work, one being their improved split foot machine, one with their latest running-on attachment for mercerized yarn. The other was on half hose silk plated work.

The Meyercord Co., of Chicago, with Philadelphia office in the Bulletin Bldg., put in a very busy week demonstrating to the visitors the way in which to use their system of transfer stamps for hosiery and other devices for increasing the sales of manufactured goods.

The Nonotuck Silk Co. exhibited a line of natural and spun silks for knitting and embroidery purposes, E. O. Gorman, well known to the knitting trade, being in charge.

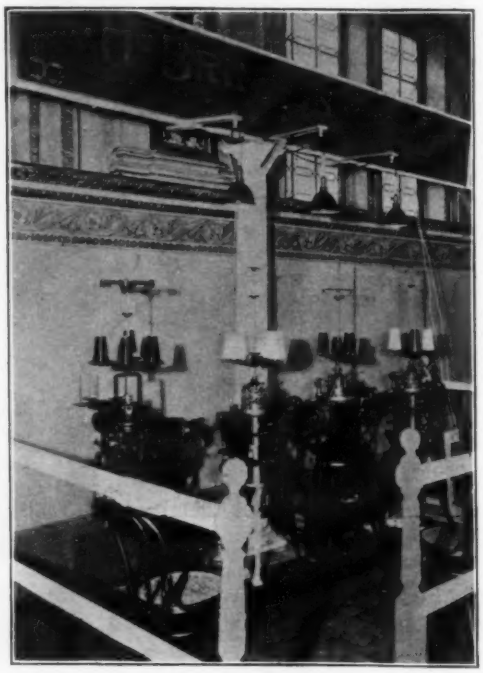
The Roessler & Hasslacher Chemical Co., of New York, through their representative, Robert A. Carter, made a practical demonstration of their method of using peroxide of sodium in bleaching textile fabrics of all kinds both cotton, wool and worsted. The exhibit was tastefully fitted up with samples of all kinds bleached by this process, which in every instance showed a perfect white without weakening of any kind.

THE ROESSLER & HASSLACHER CHEMICAL CO.

The Nicetown Dye Works, Philadelphia, dyers and finishers of hosiery showed a line of samples dyed in their establishment which were beautiful in both shades and finish.

The Karl Schlatter Dye Works, Philadelphia, showed a fine line of samples of yarns and hosiery both silk and cotton, fast blacks and colors.

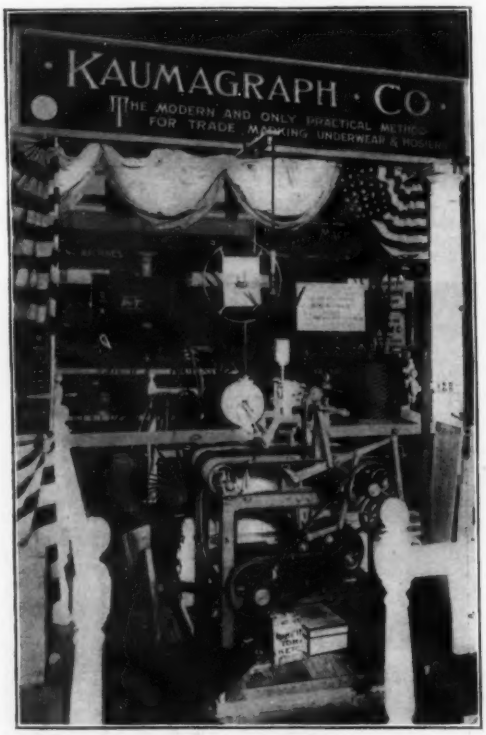
The H. Brinton Co., 213 Race St., Philadelphia, had four machines on exhibition, two for hosiery and two for neckties. The two hosiery machines were of the latest style French welt ribbers, equipped with two-speed, double-feed, and drawn welt. One of the machines was also equipped with the Brinton two-color yarn changer. There was also on exhibition the regular Brinton necktie knitter, which has been much improved since it was shown a year ago. It is now equipped to make the latest style accordion weave neckties, both in plain and striped effects. This is a 1 3/4 inch machine, with 100 needles in the cylinder. There was also in the exhibit a special 2 1/2 inch double-feed ribber, 120 needles, for making rib accordion ties in plain and stripe effects. The exhibit was in charge of Harry Klockner and Harry Horrocks.



THE H. BRINTON CO.

The Hess-Bright Co., 21st and Fairmount Ave., Philadelphia, manufacturers, displayed a very instructive exhibit of their new ball bearing hangers which they are bringing to the attention of the textile trade. An illustrated article on this appliance will be found in another part of this issue.

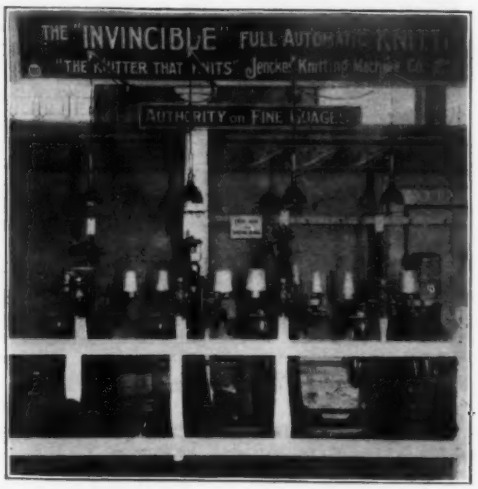
The Kaumagraph Co., 110 West 32d St., New York, exhibited and demonstrated their method of trade-mark stamping by hand and machine. The hand method is the same as they have demonstrated in former exhibitions, consisting in the use of a tissue slip bearing the desired trade-mark in a special composition. This when laid face downward on the goods and pressed with a hot iron produces a sharp and clear mark which dries



THE KAUMAGRAPH CO.

instantly. In the case of the machine the stamps are carried on a continuous roll of tissue which travels above and parallel to an endless belt. This belt travels in stages. In the center of the machine is an electrically heated iron which is attached to the end of a ramshaft. The goods to be stamped are placed on the traveling belt and are carried into the machine and under the heated iron. When in the right place the iron drops and the stamp is affixed, the goods being carried away and out of the machine. All that is required of the operator is to place the hosiery on the belt, the work of stamping being taken care of automatically. The rapidity of stamping is limited only to the expertness of the operator. A novice can easily feed the machine at the rate of 40 to 50 a minute, while with more experience the speed of 100 per minute is attained. Kaumagraph stamps for both hand and machine use are made in gold, silver or any color, and cost no more in rolls than on separate slips.

The E. Jenckes Knitting Machine Co., of Pawtucket, R. I., with Philadelphia offices at 1211-17 Filbert St., had in operation four of their grade knitting machines, including high



THE JENCKES KNITTING MACHINE CO.

speed heel and double sole machine making ladies' stockings, a machine making ladies' stockings with garter top of one yarn reinforcing with running down thread, a machine with the 17 "C" attachment making the "Iron Heel" stocking. The builders claim that this is the only machine on the market which will not float the splicing thread. The yarns used on these machines were 40s; splicing threads, 30/2. The exhibition was in charge of R. J. Morningstar, assisted by J. E. Lunt, Jr., of Pawtucket, R. I.

The Diehl Mfg. Co., Philadelphia, displayed a number of their latest types of exhaust fans, motors, etc., designed especially

for use in textile mills. The exhibition was very interesting and attracted much attention from manufacturers, especially those who contemplated installing electric power in their establishments. Mr. Fridy, in charge of this department for the Diehl Mfg. Co., was on hand to receive anyone desiring information on this subject. Special attention was called to the new type of "Venture" fan which they are at present placing before the textile trade.

THE ACME KNITTING MACHINE AND NEEDLE CO.

The Acme Knitting Machine & Needle Co., of Franklin Falls, N. H., and Philadelphia office at 6th and Arch Sts., exhibited six types of their latest knitting machines. A new feature of the exhibit consisted in a 3 1/2 inch, 260 needle machine working on 2/90s mercerized yarn as well as silk. A machine was equipped with a new reducing gear device, which reduces the speed at the beginning of the heel and toe, when changing from either the heel and toe to the circular operation. Another machine for making spliced silk hosiery is capable of making either half hose or women's hosiery, being fully automatic. There was also an all-around lace machine with a yarn changing attachment. This machine was knitting a silk stocking with heels and toes of mercerized yarn and the garter top of the same. Another novelty exhibited by them was a large sized machine for making lumbermen's socks. In addition to this there was a small machine two inches in diameter making silk tipped goods.

The American Laundry Machinery Co., New York, exhibited a number of machines of interest to the manufacturers of underwear. Their press for finishing union suits and underwear without breaking buttons or the use of press boards is something new, and is finding much favor among knit goods manufacturers. The American knit fabric ironer for finishing in the roll, balbriggan, ribbed and fleeced lined fabrics, is another machine that has been well received by the trade. The American over-driven extractor was also exhibited.

Andreykovicz & Dunk, Inc., Philadelphia, exhibited their new lines of aniline colors,

THE AMERICAN LAUNDRY MACHINERY CO.

softeners, soaps and specialties suitable for the hosiery and knit goods trade.

The Eastman Machine Co., Buffalo, N. Y., exhibited their new cloth cutting machine. This is the first year the machine has been shown at the exhibition. Several of the largest mills state that with one Eastman machine they make a saving of as high as twenty dollars a day. This cutter can be used on every class of work, from the finest to the cheapest grade, and no matter how

high the lays, will cut absolutely correct. A description of this machine will be found in another part of this issue.

H. Maimin, sole agent for the Ballard electric cutter, had a novel exhibit. The demonstrations were made by D. S. Maimin and H. Fabian under the personal supervision of H. Maimin. The line of Ballard electric cutters has been increased considerably. With their varied styles and sizes they are able to care for the finest and the coarsest of materials and as well to fit the varied purses. The Ballard electric cutter oils as well as cleans itself automatically. Instead of the old fashioned method of oiling each bearing separately, ingenious devices enable the machine to lubricate automatically while in operation. The waste oil is drained from the entire machine into two small cups on its side. By this method the manufacturer is guaranteed against having any oil spilled on his material. One of the leading features is the swinging presser foot frame, enabling instantaneous installation and sharpening of the knives. This device enables the operator to save the time which would be otherwise occupied in these operations. The baby Ballard proved of great interest to the manufacturers, as it was less than half the size of the other machines. It is adapted to fine work only. The round knife Ballard attracted much attention. It requires no oil to lubricate it. The wearing parts of the machine are lubricated by a non-meltable preparation having the appearance of grease. The protector in front of the knife is a valuable attachment, as it eliminates the danger of the operator's cutting his hand, as is frequently done on the rotary cutters.

The Charles Bond Company, 520 Arch St., Philadelphia, manufacturers of transmission machinery, leather belting and mill supplies exhibited a line of mill supplies for use in textile plants, including the Veelos Balata belt, Grundy Patent Insulated coupling for direct connections and all steel oil cans with no soldered joints, the Bond new steel hanger and other appliances. Mr. Bond also equipped the exhibits in the hall using power, with belting, shafting and hangers, giving a demonstration of the value of these goods in practical use.

Richard A. Blythe had an exhibit in connection with the Lehigh Valley Silk Mills, for which he is the selling agent. It included two of the George D. Mayo Machine Co.'s knitting machines in operation, one on silk half hose and another on ladies' silk boot stocking.

The Rose Machine Co. exhibited a line of automatic label folding and stitching machines. The automatic label stitching machine is particularly well adapted for sewing on any piece of goods such as labels, paper tags, etc., where a square or oblong line of stitching is required. It sews around the four sides as fast as a plain sewer will sew the same length in a straight line. The sewing is done by a forward back and side motion, without turning the goods around or stopping at the corners. The automatic cutting and folding machine prepares the labels for the stitching machine at the rate of from fifty to sixty a minute, by cutting the labels from the roll and turning the two ends under with a neatness that cannot be attained by hand. The labels are taken from this machine and placed in the stitching machine very much the same as a button is placed in a button sewer. The Rose Machine Co. were the first in the field with automatic label machines of this character and this was the first time that a machine of this description has been placed on exhibition.

New Branson Knitting Machine Co., successor to Branson Machine Co., occupied booth No. 25, where they were pleased to receive many friends. This company has recently petitioned for a new charter doubling the capitalization. Henry Lilley is president and George Aumheim, treasurer. They are putting out a new ribber machine in addition to their necktie, braid and mantling machines, in which fields they report good success. C. A. Williams, for a number of years connected with the Excelsior Needle Company of Torrington, Conn., and the Manufacturers' Supplies Co., of Philadelphia, has recently affiliated himself with the Branson company, becoming a stockholder, and will

be their representative. In addition to serving the trade with any style of circular knitting machinery, the Branson Machine Co. have added a supply department and can take care of any orders covering hosiery and underwear mill supplies. Their stock of latch needles is very complete, covering all styles, some in more than one make. The office and plant are located at Lehigh Ave. and Mascher St., Philadelphia.

Paxton & O'Neill, 537-41 N. 3d St., Philadelphia, exhibited their machines in operation on 220 needle ladies' and half hose, making the unexcelled fabric for which they are so well known. The ladies' hose are made of 2/70s mercerized and a 60s mercerized splicer, 4 inch welt, having a slack course as a guide for turning in, and with crow-foot effect through high splice and heel. The length is measured the same as on a ribber, making the goods practically uniform. The half hose are of ten strand silk, with mercerized tops and 2/80s mercerized splicer in heel and toe, and like the ladies' hose are noticeable for the perfection of every detail of the work done by the machine. The transfer device for rib tops is highly praised for its convenience and ease of operation, which, with the reliability, general convenience and accessibility of the parts of the machine, along with its good work and good production, make it a highly desirable machine for hosiery manufacturers.

The Metropolitan Sewing Machine Company, of Nyack, N. Y., with branch offices in the knit goods centers, showed a number of their attractive machines for the finishing of knit goods and demonstrated why they deserve the reputation they have won. They exhibited one of their style 30-T-C machines for seaming and trimming, with differential feed, the only seam trimming machine that does not stretch the goods. The 60-H-R machine for sewing on lace eliminates the process of first overedging and produces a very neat and attractive effect. The 50-C-H machine is now being introduced for such operations as butting together the back flaps on union suits, hemming and cuff sewing, etc. The 80-2-G machine is used for button stay and button facing, a radically new finish which has been adopted by a great many leading manufacturers. The 28-G-C machine is for button stay and drawer band work. The 26-A-C machine is used for overseaming, and various other styles. The 30-A-C-F machine trims, seams and binds in one operation. It will be introduced to the knit goods trade for neck binding as it saves the cutting off of the protruding seam which formerly was done by hand in almost every mill. These new machines can always be seen in operation at the Philadelphia office, 1213 Filbert St. Mr. Wm. Donnell is their district manager.

The Charles Beck Company, 609 Chestnut St., Philadelphia, exhibited their Brehmer pointed staple stitcher which is used for attaching labels or rider tickets to hosiery and underwear. This is a machine which has been widely advertised, and is being used by many large manufacturers in this country. Among the features responsible for its success is the fact that it uses wire almost as fine as a hair. The ends of the staple have a long angled point which may be placed through the most delicate fabric without injury. This is not possible where a blunt pointed staple is used, for the latter, when forced through the material breaks the threads and causes many complaints from the consumers. The staple of the Brehmer stitcher may be easily removed by picking the stitch out with the fingers. In addition to the Brehmer stitcher the company had on exhibition a Keystone gem lever paper cutter, which, originally used in the paper trade exclusively, has been adopted by many knit goods mills who do their own labeling and boxing. A representative of the company was on hand to explain details of the machine, show samples of its work and answer questions.

The Acme Staple Co., Camden, N. J., exhibited a line of hand stapling machines in different sizes, for attaching tickets to all classes of fabrics. They also showed one of their new power machines for doing the same line of work.

The Chas. Bond Co., the well known mill supply dealers of Philadelphia, equipped their

booth with various lines of shafting and mill supplies for uses in all classes of manufacturing establishments.

McConnell & Co., Ltd., Manchester, Eng., with Mr. John Hayes of the company and H. M. Remington, their American representatives, Letitia & Chestnut Sts., Philadelphia, in a tastefully decorated booth, displayed the various grades of mercerized yarns which they are spinning in Europe, and which they are now pushng in this country. The yarns shown by them ranged in counts from 40s to 300s in single and ply. To demonstrate the high grade of their products for knitting purposes, the company had a George D. Mayo knitting machine in operation showing the yarn as it run through the machine.

The Frank H. Stewart Electric Co., who represented the Buckeye Electric Co., of Cleveland, Ohio, manufacturers of all kinds of incandesent lamps and also manufacturers of the famous Buckeye drawn wire Mazda lamps for textile mill lighting, showed a full line of their various ilghts which are now being extensively used in textile mlls. W. O. Conley, their district manager in the East, is glad at any time to furnish information appertaining to lighting textile plants of any kind. J. M. Smith, the manager of the Industrial lighting department of the Buckeye Electric Co., who read a paper at the convention, was in attendance, meeting old and making new friends.

J. W. Hepworth & Co., Philadelphia, Pa., exhibited their new two-thread looper. This machine is even more simple in operation than the old single-thread looping machine. On the new two-thread looper there are no irregular shaped cams, the motion being obtained entirely by eccentrics, hence there is no irregular cam movement that would cause any adjustment. The new Hepworth machine has been tested for nearly a year before it was offered for sale, and the builders are convinced that they now have the simplest two-thread elastic stitch looper.

Among other exhibitors were the following: American Type Founders Co., Albert I. Croll, Silcox Pure Water Co., Southern Textile Machinery Co., J. Spencer Turner Co., Wholefoot Hosiery Stamp Co.

THE KNIT GOODS MANUFACTURERS' ASSOCIATION OF NEW YORK

A largely attended meeting of this association was held at the Hotel Ten Eyck, Albany, N. Y., on May 10th. The meeting was held behind closed doors and after adjournment the announcement was made of the business transacted. A resolution was adopted that the goods for 1912 should not be opened before July 10th. The proposition made by the National Association of Hosiery and Underwear Manufacturers that the two associations unite to form one organization was considered and rejected by a unanimous vote. It was pointed out that nearly three-fourths of the underwear produced in the United States was manufactured in mills between Cohoes and Syracuse, and that this fact made it advisable for the New York State manufacturers to retain a separate organization. Plans were adopted for bringing into the association a larger number of New York State manufacturers so as to make the organization representative. Following is a list of the officers elected for the ensuing year:

President, John R. Blood, treasurer Blood Knitting Co., Amsterdam; first vice-president, J. K. Stewart, John K. Stewart & Sons, Amsterdam; second vice-president, George A. Clarke, secretary Brown Knitting Co., Warsaw; third vice-president, Frank B. Harder, president High Rock Knitting Co., Philmont; fourth vice-president, J. H. Reaney, Union Mills, Hudson; fifth vice-president, Thomas Bailey, treasurer, Bailey Knitting Mills, Fort Pain; treasurer, Beecher M. Crouse, treasurer Avalon Knitwear Co., Utica; secretary, W. H. Morton, Utica.

Following is a list of those present: Thomas R. Bailey, Fort Plain; John R. Blood, Amsterdam; W. T. Briggs; George A. Clark, Warsaw; Andrew Frey, Utica; Oscar G. Gridley, Utica; Nathan Hatch, Albany; W. D. Mahoney, Troy; Quentin McAdam, Utica; H. S. McElwain; W. H. Plunkett; D. A. Sifnt, Little Falls; A. J. Stone, Philmont; James Stewart, Amsterdam; G. M. Traber, Perry; Roger Rock, Utica; J. H. Reaney, Hudson; Eugene West, Syracuse; Charles C. Washburn, Amsterdam and W. H. Wild.

THE NATIONAL ASSOCIATION OF WOOLEN AND WORSTED OVERSEERS

The twenty-ninth semi-annual meeting of this association was held at Crescent Park, Providence, R. I., on Saturday, May 20th. There was a large attendance, more than was really expected from the fact that a great many members had not returned the card which was sent them by the committee on arrangements, and which bore a request that it be returned with statement as to whether or not the member would attend the meeting. The object of this was to give the committee on arrangements time to prepare for those who intended to be present. Not having been notified that so many were to attend the committee were not prepared for such a large gathering. Those present agreed they had a good time, as it were, but it is to be hoped that in future those who intend to go to the meeting will notify the committee in charge.

The meeting was called to order at 11 o'clock, the reason for the delay being that some of the members found difficulty in finding Crescent Park. Those who came by electric cars from the city had no trouble in getting to the park but those who went from Providence over the Fall River road were somewhat puzzled which way to go after landing at the station and a number of them went about two miles out of their way.

President Gallagher called the meeting to order. As soon as President Gallagher called for nominations for president his name was proposed for reelection. Mr. Gallagher announced that he could not accept reelection for another year. James H. Pickford and Louis Allison were placed in nomination. The other nominations were as follows: First vice-president, Jos. T. Dolan and R. G. Hill; second vice-president, W. C. Hill and Walter Nieber; third vice-president, E. L. Taft; secretary, Walter Pickford; treasurer, Thomas Buchan; secretary of Beneficiary Dept., H. G. Morey; treasurer of Beneficiary Dept., Thomas Buchan. The election will be held at the next annual meeting.

Thomas Buchan, treasurer of the beneficiary department announced that a bill of $7.50 remained over from the previous meeting. This gave rise to a long debate, the bill having been for the services of a stenographer in copying reports of the previous meeting. Charles Hurst, a member of the board, claimed that the bill was held up for two reasons. First, that the board had a paid secretary whose duty it was to take records at the meetings. Secondly, because they thought the secretary should not engage a stenographer without consulting the board. John Burns suggested that the bill be approved and a motion was made and seconded that the bill should be paid.

James McDowell, a member of the outing committee, said he hoped the result of the day's outing would speak for itself.

There was some discussion in regard to changes in the organization providing that the beneficiary department would be separated from the association. T. F. Brennan opposed the separation of the beneficiary department. On motion of Secretary Pickford the matter was indefintely postponed.

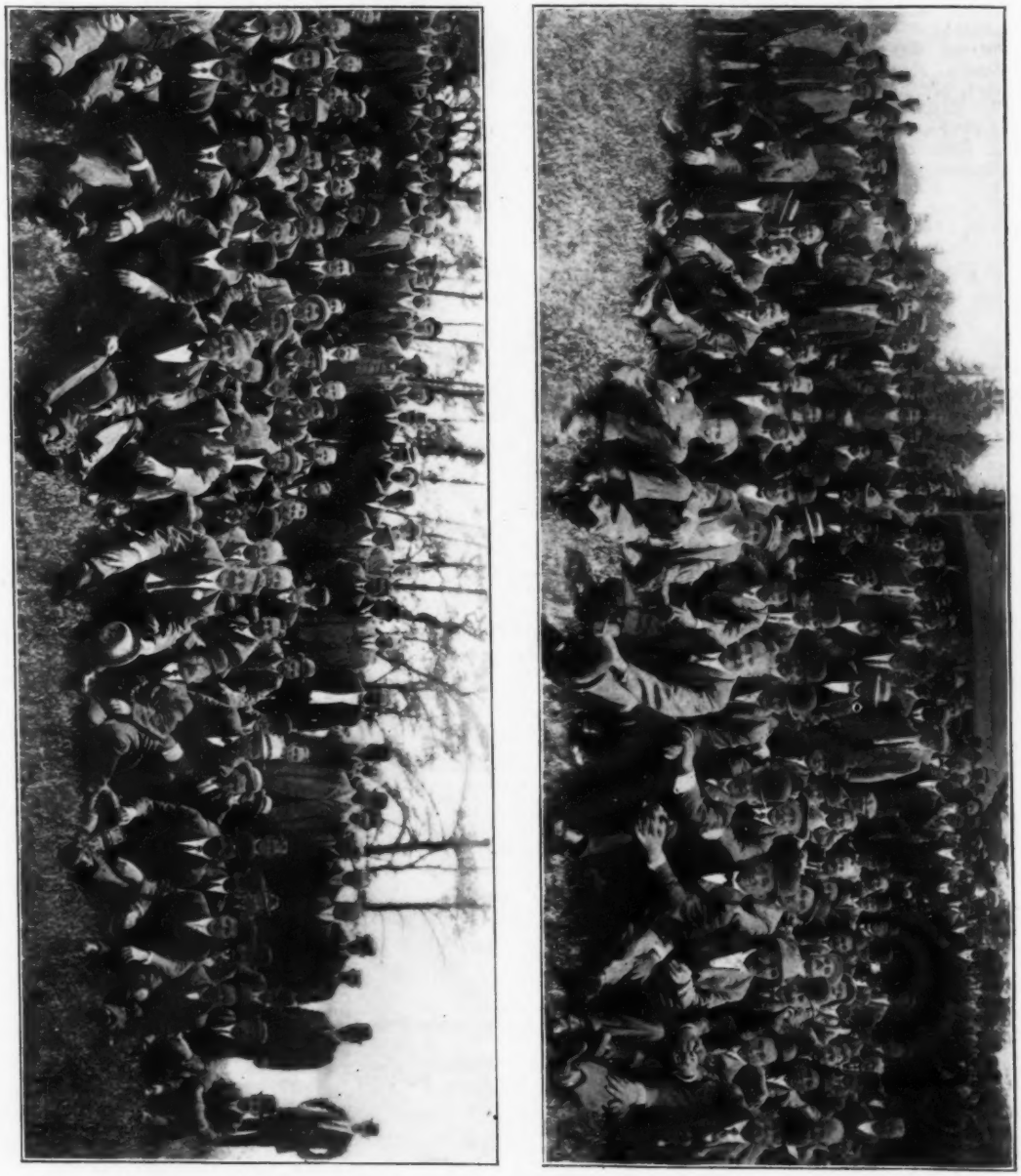
The discussion which was brought up at the meeting in Boston last fall to limit membership to those who were overseers only was also indefinitely postponed.

The next question before the meeting was the organization of an employment bureau for the association. A number of the mempapers published which gave as good reports be advisable to have a bureau connected with the Association. After some discussion among the different members, this matter was also indefinitely postponed.

Secretary Walter Pickford moved that Fiber and Fabric be the official organ of the association and serve as an Overseers' Bureau. This aroused no little discussion and a number of members expressed themselves freely, saying there were other textile papers published which gave as good reports of their meetings as Fibre and Fabric and that they saw no reason why they should not have some consideration from the association. There was a call for a vote on the matter and it was voted that no textile paper should have the preference.

A motion was made by John Bolger to name a committee of three to get up a button to be presented to each retiring president and vice-president. Messrs. Bolger, Hurst and McDowell were named as the three and it was decided to have the button ready for the next meeting.

After the banquet the members were photographed. The members then assembled in the hall for the afternoon session. An amendment was proposed to hold all meetings in the future at 10 a. m. sharp. This will be voted on at the next meeting. The meeting adjourned at 4 o'clock.



MEMBERS AND GUESTS AT THE OVERSEERS' MEETING.

The applications for membership were as follows:

Applications for membership were received as follows: R. B. Smith, Lebanon, N. H.; Charles Gledhill, Tilton, N. H.; V. E. McKinstrey, North Adams, Mass.; W. A. Phelan, Phenix, R. I.; J. F. Eysers, Rockville, Conn.: R. B. Alexander, Maynard, Mass.; C. J. Broadbent, Maynard, Mass.; G. H. Eastwood, Pascoag, R. I.; A. S. Dunlop, Holyoke, Mass.; J. C. Cantlin, Franklin, Mass.; F. L. Babcock, Boston, Mass.; G. J. Greendonner, Farnumsville, Mass.; John Heffermann, Blackstone, Mass.; H. L. Stewart, Dayville, Conn.; C. H. Cook, Proctersville, Vt.; Thos. Graham, Pittsfield, Mass.; M. C. Brannell, Franklin, Mass.; W. F. Hines, Centreville, R. I.; W. N. Oldham, Millbury, Mass.; Thos. Brennan, Potter Hill, R. I.; J. A. Daley, Westerly, R. I.; Lyman Ham, Potter Hill, R. I.; A. W. Marriot, Westerly, R. I.; James Hawes, N. Bellingham, Mass.; John Cantlin, Providence, R. I.; G. W. Greenbank, Uxbridge, Mass.; Andrew Greghorn, Woonsocket, R. I.; X. M. Lehman, Burlington, Vt.; T. E. Foley, Lowell, Mass.; David H. Webster, Providence, R. I.; Medric Reinstein, Providence, R. I.; J. W. Marsden, Peace Dale, R. I.; James Stickley, Wakefield, R. I.; Robt. Cameron, Peace Dale, R. I.; Ernest W. Gross, Pascoag, R. I.; J. A. Heaton, Huntington, Mass.; Eugene Kirby, Huntington, Mass.; R. W. Ringland, Nasonville, R. I.

The following are the names of members present:

CONNECTICUT

John J. Lanahan, Norwich.
H. G. Moorey, Danielson.
F. C. Neff, Rockville.
Wm. Jowert, Central Valley.
Burt O. Cooke, Central Village.
Wm. H. Nettleton, Central Village.
Wm. Evers, Central Village.
John H. Winslow, Killingly.
E. R. Toop, Rockville.
Andrew Arsher, Dayville.
Edwin A. Schreier, Stafford Springs.
Charles J. Henault, Norwich.
Thomas Moran, Bristol.
Theodore St. John, Thompsonville.
C. M. Ellis, Putnam.
J. J. Burns, Moosup.
Burt Ashton, Hazardville.
George R. McDougall, Putnam.
Edward H. Aurbach, Windsor Locks.
A. B. Shephard, Stafford.
Frank P. Coughlan, Quinebaug.
James Mack, Quinebaug.
J. E. Bradley, Talcottville.
John Heaton, Central Village.
W. H. Sanford, Norwich.
John Kennedy, Mystic.
Wm. F. Myers, Addison.
Fred Thorpe, Talcottville.
Samuel H. Walsh, Putnam.
J. J. Lyons, Moosup.

MAINE

C. A. Williamson, Foxcroft.
Geo. H. Newry, Dexter.
James F. Quinn, Waterville.

MASSACHUSETTS

John F. Dummord, Lawrence.
J. W. Bond, Lowell.
W. B. Pine, East Douglass.
G. W. Schellschmidt, East Douglass.
Peter Rainville, East Douglass.
I. F. McLavin, East Douglass.
J. C. Weeks, East Douglass.
Wm. T. Lausnis, East Douglass.
Walter Nisbert, North Bellingham.
Charles M. Davis, Blackstone.
Alex. Carmichael, North Andover.
J. F. Scott, Andover.
Benjamin Oldfield, Methuen.
F. L. O'Leary, Boston.
Simon Kenney, North Andover.
John W. Linnehan, Boston.
M. N. Bresett, Pittsfield.
P. J. Harney, Methuen.
C. F. Dowling, Boston.
J. N. Lavin, Cherry Valley.
John P. Barry, Cherry Valley.
J. J. Rae, Cherry Valley.
Joseph A. Bolger, Worcester.
C. F. McGill, Maynard.
Keans Whalen, Huntington.
T. W. Kennedy, Lawrence.
Joseph E. Avery, Millbury.
Thomas Lyons, Pittsfield.
Frank Norris, Pittsfield.
George A. Copeland, Watertown.
Frank H. Doyle, Millbury.
G. R. Howard, Caryville.
George Fraser, New Bedford.
F. A. H. Ballou, Worcester.
John C. Marley, Lawrence.
John Hughes, North Billerica.
Asa Garth, Fitchburg.
Wm. McConachin, Clinton.
E. W. Kill, Middleboro.
J. E. Truesdale, Jefferson.
James Horsfall, Lowell.
Clarence S. Gave, Uxbridge.
Hugh Wyer, Uxbridge.
Thomas J. Rigney, Webster.
R. F. Crane, Millbury.
E. H. James, North Andover.
W. J. Pearce, Webster.
George Weshart, New Bedford.
Emil Kisro, Webster.
B. V. Searis, Lowell.
H. A. Fretts, North Adams.
Thomas Thomas, Lowell.
E. S. Eddy, Worcester.
F. L. Whittemore, Charlton City.
Walter Pickford, Clinton.
Thomas Buchan, Hyde Park.
M. J. Fagan, Concord Junction.
James Toban, Holyoke.
Henry Shaw, Leominster.
Jacob Ashler, Webster.
P. J. Brisbois, Webster.
P. Riley, Uxbridge.
A. C. Neff, Millbury.
J. S. Turner, Lowell.
John Graham, Lowell.
George Hinchcliff, Oxford.
James Cavin, Webster.
Daniel T. Shea, North Bellingham.
Thomas E. Byron, Saxonville.
Daniel Sullivan, Oxford.
Joseph Carter, Uxbridge.
Harry G. Stevens, Boston.
F. W. Bukinshaw, Watertown.
A. C. Fredrick, Pittsfield.
H. C. Templeton, Lowell.
Herbert Nudgeley, Worcester.
Richard Thomas, Lawrence.
Wm. McKinnon, Farnumsville.
F. W. Nash, Oxford.
E. T. Buxton, East Douglass.
James H. Cobb, Caryville.
T. F. Brennan, Somerville.
D. C. Fisher, Dorchester.
W. C. Hay, Uxbridge.
F. L. St. George, North Bellingham.
F. L. McCarthy, Fitchburg.
Louis M. Allison, Worcester.
James A. Laprack, Lowell.
Thos. Pendergast, Newton Lower Falls.
T. E. Moore, Webster.
J. F. Geb, Franklin.
Burnett J. Fetherston, Pittsfield.
Patrick Mulligan, Uxbridge.
John Henderson, Cordaville.
Thomas Goddard, Caryville.
George Baxter, Caryville.
Frank Stott, Webster.
Turner Rollison, Franklin.
J. E. Flanagan, North Bellingham.
F. A. Brown, Monson.

NEW HAMPSHIRE

T. N. Parent, Franklin Falls.
Thomas Mullin, Franklin.
E. P. Sweeney, Lebanon.

NEW YORK

L. E. Bond, Auburn.
Martin H. Welch, Auburn.
P. F. Hanlon, Stottville.
W. T. Supple, Amsterdam.

RHODE ISLAND

Robert C. Kolb, Oakland.
Edward Smith, Woonsocket.
Joseph Kallier, Woonsocket.
F. P. Gallagher, Providence.
J. H. Pickford, Carolina.
R. J. Hill, Woonsocket.
Joseph T. Dolan, Harrisville.
F. W. Clarkson, Glendale.
H. S. Ringland, Providence.
Moses Spencer, Woonsocket.
Carl Hager, Providence.
James Knox, Woonsocket.
W. E. Chamberlain, Woonsocket.
A. J. Wicks, Manton, R. I.
Edgar M. Taft, Bridgeton.
John F. Hardman, Pascoag.
J. H. Creaser, Harrisville.
John H. Greenhalgh, Woonsocket.
George F. Eagan, Pence Dale.
James Wilson, Providence.
F. Fraser, Glendale.
Lees Mallison, Mapleville.
Michael F. Quinn, Pascoag.
J. E. Leach, Lafayette.
J. G. Burns, Providence.
J. B. Curtis, Wakeville.
Edward Greaves, Olneyville.
F. J. McCaule, Woonsocket.
Ephraim Bedford, Thornton.
James McDowell, Providence.
J. B. Bennett, Providence.
John T. Northrop, Providence.
P. T. Donahue, Woonsocket.
Frank Wiessners, Providence.
William C. Hill, Oakland.
Walter Gledhill, Providence.
W. E. Deorin, Hope Valley.
Albert Ainley, Mapleville.
Jacob Jones, Mapleville.
Louis Carmack, Lymansville.
John F. Campbell, Providence.
J. F. Bresett, Bridgeton.
Charles North, Washington.
John Henderson, Providence.
A. Larmine, Greenville.
C. H. Blackburn, Potter Hill.
George R. Burdick, Kenyon.
C. L. Lariviere, Pascoag.
Rinaldo E. Green, Mapleville.
Patrick Percell, Manton.
J. T. Patterson, Woonsocket.
R. H. Bailey, Centreville.
Thomas Gordon, Oakland.
T. W. Biddles, Westerly.
Frank Eder, Olneyville.
P. J. Mahone, Bridgeton.
Charles Brown, North Kingston.
Charles I. Keegan, Pascoag.
H. E. Whittaker, Pawtucket.
Oscar T. Doyle, Thornton.
H. Morrell, Graystone.
H. Ainsley, Wickford.
George Kavanaugh, Providence.
Thomas Parkin, Providence.
H. Fred Deverall, Providence.
Julian Guerin, Woonsocket.
John Guerin, Woonsocket.
George Templeton, Greenville.
Ernest Sutcliff, Manton.

R. C. Shortmann, Olneyville.
Fred Charland, Woonsocket.
George Murray, Mapleville.
Robert Russell, Woonsocket.
Thomas J. Ryan, Pascoag.
Edward Fanning, Pascoag.
Ulick Burke, Carolina.
George H. Coleman, Pascoag.
M. J. McTighe, Pascoag.
Wm. Pashley, Ashaway.
Herman Aurbach, Lymansville.
S. E. Lancaster, Pawtucket.
R. J. Hill, Woonsocket.
Henry Brooks, Providence.
P. F. Doyle, Wickford.
E. Powers, Kenyon.
Squire Kershaw, Greystone.
Charles Attridge, Harrisville.
E. H. Boyce, Farmerville.
O. A. Kurze, Providence.
H. O. Werner, Providence.
James Carmack, Woonsocket.
C. B. Jennings, Woonsocket.
David Webster, Harrisville.
Fred Carter, Pascoag.
C. F. Hacking, Providence.
Charles H. Attridge, Providence.
Charles M. Hurst, Providence.
D. E. Coe, Providence.
James H. Toop, Washington.
Fred R. Williams, Harrisville.
F. W. Allen, Harrisville.
John F. Fitzpatrick, Woonsocket.
Lewis Dicks, Woonsocket.
John Moore, Centreville.
Wm. F. Hines, Centreville.
H. B. Hazen, Davisville.
George E. Bidwell, Woonsocket.
Joseph H. Driscoll, Manton.
A. B. Crowell, Greenville.
F. R. McClure, Woonsocket.
Matthew Hollings, Peace Dale.
F. W. Greenhalge, Peace Dale.
Maurice H. Rinnecon, Peace Dale.
Leonard Hinchliff, Peace Dale.
P. L. McBride, Woonsocket.
Wm. M. Lacy, Pascoag.
T. J. Jennings, Pascoag.
Frank E. Logan, Pascoag.
H. Hopkins, Providence.
James Southwell, Providence.
Wm. Waterhouse, Providence.
S. J. Nield, Providence.
John Heathermae, Oakland.

PHILADELPHIA

George B. Clemence.
John F. Bolger.

VERMONT

Wm. A. Bagley, Proctorsville.

CANADA

Earnest N. Brooks, Sherbrooke.

THE SOUTHERN NEW ENGLAND TEXTILE CLUB

A meeting of this club took place Saturday, May 27th, at Laban's Folly, Padanaram, nearly 200 members being present. The weather was exceptional, which no doubt accounts for the large number present. A clambake was one of the features of the meeting, and this was thoroughly enjoyed.

While the tables were being cleared President Dimick called the meeting to order and Henry Dexter proposed an amendment to Article 7 of the by-laws, increasing the membership to 300, to be composed of 200 mill men and 100 members of allied interests. Mr. Dexter's amendment was passed unanimously and heartily applauded. Mr. Dexter then mentioned that a committee of three be appointed by the president, to nominate officers to be voted for at the annual meeting on June 17th, and President Dimick's choice was Messrs. Abbot P. Smith, Henry Smith and Herbert R. Lowe.

The party then adjourned to the New Bedford Yacht Club close by, where Abbot P. Smith gave an interesting talk on the Panama Canal. This was illustrated by means of a chart, and as Mr. Smith has spent much time in that place his remarks were made from personal observations. Previous to Mr. Smith's talk, Henry P. Dexter introduced Lieut. Gov. Louis Frothingham, who gave an interesting address on the workmen's compensation movement.

The committee on arrangements were as follows: Charles Holmes, chairman; Abbot P. Smith, James Thompson, Jr., Fred Howe and George Hinckley.

THE BARCELONIA COTTON CONGRESS

The eighth Congress of the International Cotton Federation was held at Barcelonia on May 8 and 9, and was attended by about three hundred delegates. On the day before the opening of the Congress Sir Charles W. Macara, president of the Cotton Federation visited Madrid where the King of Spain conferred on him the Grand Cross of Merito Agricola, the highest distinction of the order. Senor Colvet presided at the Congress and in his opening address called attention to the fact that Catalonia was one of the finest European provinces to engage in the cotton trade. President Macara in his annual address referred to cotton manufacturing and cotton growing as follows.

I regret that in meeting you at the eighth International Congress I have to report that the state of the cotton trade throughout the world is still very unsatisfactory. No amount of knowledge or industry can save us from disaster if things go on as they are now. If we had had a sufficient supply of raw cotton at a reasonable price there would probably have been work for all the spindles and all the looms, large though the additions to machinery have been in recent years, but with cotton comparatively scarce and prices enormously high there has been most serious curtailment in the consumption of cotton goods, and that curtailment has disastrously affected the trade not in one country but in all countries. Determined efforts continue to be made to increase the supply of the raw material from the present cotton fields and to open up new sources of supply wherever this can be done successfully. I am emphatically of the opinion that the speediest relief for the shortage in the supply of the raw material for the cotton industry of the world will come from India.

The emphasis laid on Indian cotton is in line with the discouraging reports of cotton growing in Africa. Even India, however, does not promise complete relief for Presi-

dent Macara fell back on short time as the only really effective remedy for the cotton shortage:

We want cotton-growing to be remunerative to the grower just as we want cotton manufacturing to be remunerative to the spinner and manufacturer, and we shall never have continuity of satisfactory trade until we have put in operation means to deal effectively with those who increase the price of our raw material by gambling operations. I confess I do not see any immediate prospect of relief from the existing state of things unless we resort to the plan which I advocated both before and since the International Federation was established, and which I advocate now more strongly than ever, the adoption of systematized short time, an arrangement which will enable all to bear an equal share of the burden according to their strength and which will impose a ruinous burden on none. Having very near to my heart a desire for universal prosperity in the cotton industry, I earnestly hope that disaster may be staved off by an early resort to this plan, which is the fairest to both employers and operatives.

The second day of the Congress turned largerly on increasing the cotton supply. Papers were read by Moritz Schantzo of Germany, and by R. H. Jackson and J. M. Thomas of Lancashire. Harvie Jordon and A. S. Qerrill represented the American growers. Mr. Jordan extended an invitation to the Federation to repeat the 1907 visit to the American cotton belt:

Since the visit of the European spinners to the Atlanta Conference in 1907 American growers have adopted many reforms in the cultivation, harvesting and marketing of cotton. The growers are fast learning that the spinners were not only their customers, but their best friends, and extend to them a cordial invitation to visit the cotton belt again. To meet the views of the spinners in favor of the better handling of cotton, the growers propose to introduce a square bale gin, which was in the nature of a revolution and meant, if successful, the abolition of the present antiquated, expensive and wasteful methods. Naturally vested interests would place obstacles in the way of the new system, but the cooperation of planters and spinners must prevail. The change would save five dollars per bale, or on an average yearly crop sixty million dollars. Both spinner and grower were interested in securing that economy. The present bad manner in which American cotton was delivered abroad was a reflection upon our intelligence, and was the outgrowth of an antiquated system.

On the third and last day of the Congress Herr Kuffler, of Austria, presented an interesting report on fire insurance.

He found that, taking a sprinkled fire-proof mill of the value of £127,000, the cost of insurance in England under the mutual system would be £180, in France £200, in Germany £230, and in other countries more.

M. E. Rabatto, of France, came forward with a scheme for an indemnity fund against short time. This fund was to be raised by a general levy on spinners and to be used in case of a shortage of American cotton. He said:

The present crisis in the trade is one of the worst for a quarter of a century, and proves the necessity for an organization sufficiently powerful to fight wild speculation, which knew no limit. The only weapon which spinners possess for checkmating the disastrous prices of raw material is short time, and this will never be of sufficient efficacy if it is not decided upon at the right moment by 80 or 90 per cent. of the hundred million spindles using American cotton. I recommend an indemnity fund, raised by levy, the fund only to be used in case of a generally recognized shortage of American cotton.

Herr Kuffler gave an account of a conference between the Federation and the cotton exchanges of Liverpool, Havre and Bremen regarding baling cotton and allowance for excessive damp. The exchanges agreed that it was desirable to introduce a new contract based on net weight instead of the 6 per cent. allowance for tare. It was recognized that the cif and six contract was largely responsible for the bad baling of American cotton, because it was necessary to wrap enough rubbish around the cotton to equal the 6 per cent. tare for which the European contract provides. The Textile World Record has for years pointed out this cause of bad baling, and it is gratifying to have the Cotton Federation recognize it.

Resolutions were adopted condemning the Liverpool, Havre and Bremen exchanges on the question of damp in cotton, and recommending that the members of the Federation purchase a part of their cotton on the net weight basis in order that the American planter may be induced to adopt a better method of baling. An invitation was received to hold the next Congress in Holland.

The value of silk manufactures imported into the United States increased from $27,880,683 in 1899 to $32,707,982 in 1909.

The total imports of hosiery and underwear into the United States from Nottingham, England, for the year ending December, 1910, amounted to $216,745.

MILL EXPERIENCES

Under this head we will publish from time to time stories from practical mill men, telling of vexatious and unusual difficulties which have occurred in different branches of mill work, and how they have overcome them. We invite mill men to send us an account of such experiences. We pay of course for all that we use. Facts told just as you would tell the story to a friend are what we want, not fancy writing.

The article in this issue describes some peculiar troubles of an overseer of weaving and how he overcame them.

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HOW I STOPPED SOME TROUBLE IN A WOOLEN WEAVE ROOM

BY AN OLD-TIMER

(Continued from May.)

After the orders were filled we started making crash for suitings, a white warp, black filling, white warp and brown filling. Any foreman in a weaving department will acknowledge that this is the hardest fabric to make on account of the contrast between warp and filling. The agent asked if I had ever made similar goods and I told him I had, but that the yarn would have to come better to the weave room, better than I had ever seen it since I had been there, in order to make the goods perfect. The warps were dressed and the agent suggested that I put on all the shuttles that I could get on. Seven shuttles at the most were all that we could put on, but I knew that five shuttles on a cotton weave was better than seven. The first warp I started with five, the next with six, the third with seven, and the fourth with four shuttles, the boxes running three, one, two, four, so as to get a pick off of each shuttle alternately. The weavers at this mill had never woven anything over four shuttles and they were very much worked up on account of the extra shuttles being put on. After the first cuts from each of these four looms were woven, I asked the agent and superintendent to come to the finishing perch to see which they thought looked the best and to get the best opinion I could as to which would be the number of shuttles to run. The agent thought five shuttles looked best, and the superintendent stated that the piece woven four shuttles was the best. The agent called me to one side and told me to weave the cloth on five shuttles and do the best I could with it. Before starting these goods I had taken all the warp beams and examined them carefully to see that the arbor was not sprung, as this is often done by dresser tenders taking a beam out of the beamer, and when they are sprung bad they will bind in the loom and cause uneven cloth.

This class of goods came along as well as could be expected from a large mill. When they came from the small mill they were woven on four shuttles according to the superintendent's order and were very uneven. The agent found that they were being woven on four shuttles and insisted on them being woven on five, but still they did not come as good from the small mill as they did from the large, because the beams had not been looked over. The agent sent for me to come to the office one evening and said he was going to put me in as overseer of both mills, as the goods which were coming from the small mill were all seconds. I asked him what he intended to do with the man he had in the other mill and he said he was going to let him go. I told him I did not like to see him do that as the other mill was so far away from the large mill it would be more than one man ought to look after, and if he would retain the other boss weaver and send him to me I would tell him what to do. The next day the overseer came to me, but did not mention that he was advised to come to me for information. He questioned me as to what I was doing to make the goods better than those he was getting out. It ended by my going to his weave shop and looking over the looms, although he was rather reluctant at first, as I presume he did not want to have it said among the help that he had to call for assistance.

I advised them to do as I had done, and rather than make any more seconds to stop the looms and take the warps out and run them back on the dresser, re-beam them onto beams which we had fixed up. This being done the first cuts which came off of the looms afterwards were as good as those we had been making in the large mill.

The one great trouble in this mill was that

the native help did not like to see a stranger come there and get along any better or do anything different from what they had been accustomed to.

The weavers were in the habit of making from eight to twelve pounds of waste on 2 1/2-run yarn each week. I knew this was more than should come from each loom and on making an investigation I found that at the bottom of each bobbin for several yards the filling was wound soft. I examined the looms to see if there was too much power, which would loosen the yarn on the bobbin. This being all right I knew the trouble was in the spinning room and instructed the weavers to take out the bobbins when they were woven down to the soft part and hand them to me when they had a dozen or fifteen and I would call the boss spinner's attention to the matter. It happened the day I went to the spinning room with a large handful that the superintendent and spinner were talking together and I asked him if he could not help me out so that the weavers would not make so much waste. The superintendent spoke up and mentioned the fact that the yarn was the same as it always was from the spinning room and I told him if it was and had been going that way for any length of time that it was about time it was stopped.

ENGINE WASTE MANUFACTURING IN EUROPE

BY M. E. C.

With the growing of the textile manufacturing the trade in old waste materials from textile mills has developed to a very large extent. Once thrown away as useless, this waste is now an important feature in the manufacture of many things. Many are the purposes for which cotton and woolen wastes are now being used, and the manufacturing of engine and machinery waste out of textile mill waste is one of the important uses in the European waste trade.

It is not so long ago that European railway companies used cop thread waste in the original state it came from the cotton mills, for the cleaning of the engines. They soon found out that this way of employing cop threads was not economical. They decided to try a new product called "engine waste" (Putzwolle) and this particular trade has since become very important, employing many thousand hands and using enormous quantities of textile mill waste, representing a value of several million dollars. There are two principal grades manufactured in Europe, white engine waste and colored machinery waste. The first grade is made from white cop threads and other white waste material. Cop threads being expensive, substitutes had to be found to produce a cheaper fabric. Old white lace curtains, once used only for paper making purposes, are now converted into engine waste. The curtains are pulled up on a specially built machine called a "Reisswolf" (picker). One machine can do about one ton per day. The product resembles white linen threads, only, of course, much shorter in fiber. One girl can feed a machine and the cost of manufacturing this substitute is not more than about 30 cents per cwt. Old lace curtains being cheap, the product thus obtained does not cost more than 3 1/4 to 3 1/2 cents per pound, including the loss of weight and the waste which naturally results in the process.

Another substitute used in bringing down the price of engine waste is old cast off cotton rope, such as every cotton mill uses on the selfactors as driving ropes. One would hardly believe that these old greasy looking ropes could ever be turned into white engine waste. Still it is done. The ropes are chopped into pieces about 20 inches long and the surface, which is greasy and oily, stripped off. The interior of the rope being snow white, the different strings used in the weaving of the rope are separated and the result is a white cotton thread almost as good as new cop threads. The oily and greasy part of the rope is used in the making of colored waste. The cost of the product thus obtained, including loss of weight, price of cotton rope, etc., is only about 4 cents, certainly cheap when compared with the price of cop threads, which is about 11 cents. Still another grade is used in the manufacture of the white waste, and this is a so-called Kehricht (white sweepings, such as cotton mills sell as waste). These sweepings contain the best cop threads, loose waste and

all sorts of rubbish, like paper, strings, rags, etc. To get a suitable substitute the sweepings are cleaned in a specially constructed machine, which separates the long threads from the loose waste and rubbish and turns out a fairly white looking product very suitable for the purpose.

All these substitutes ready, the mixing of the materials is begun. To this purpose a great blend of the various raw materials is prepared. Supposing a medium priced white waste is to be made, this would be the contents of the blend:

25% best white cop thread
30% old lace curtains
20% white cotton rope
25% white sweepings.

These raw materials are mixed and a blend of about 5 tons at a time is made. The larger the quantity, the better the mixture. The blend ready, the real process begins.

Along the factory in front of the blend are the machines used for turning this mixture of raw materials into engine waste. There are two kinds of machine, the so-called "English machines," with a capacity of turning out 4/5 tons per day, and "German machines" making about one ton daily. The first kind is built in Rochdale, England, the German machines coming from M. Gladbach (in Rhineland). The product obtained by English machines is rather short in fiber and contains a lot of loose waste. For this reason Continental railways do not use it, but insist on waste produced on German machines. The process itself is quite simple. First a layer of the best white cop threads is put on the feeder, after that a quantity of the blend and then the machine is started. The feeder brings the material to the two cylinders, which are furnished with strong, powerful iron teeth. Here the waste is torn up, the threads are stretched out and combed and then the machine is stopped. The waste is loosened from the cylinders by means of a large hook and the engine waste comes out in the form of two big bunches weighing about 25 to 30 pounds. These bunches are then packed in iron hooped bales, weighing from 200 to 500 pounds and the engine waste is now ready for the market.

The manufacturing of colored waste is practically the same as that of white waste. The principal raw materials used are colored cop threads, colored sweepings, dyed jute thread waste, oily cotton ropes, old jute bagging (which is first dyed green or red and then pulled up on the picker like lace curtains). Also colored cotton and linen thread waste of every description.

By using all these cheap substitutes it is now possible to make a tolerably good white waste at as low a price as 5 cents and colored waste from 2 cents up. The quantities used by railroads and steamship companies are simply enormous. The Prussian state railway, for instance, buys about 750 carloads of 10 tons each every year, representing a value of about 3,000,000 marks. Other railroads buy similar quantities and the consumption of engine waste by the big steamship companies is of great magnitude. Besides, very large quantities are bought by the big iron and steel mills, coal mines and other factories.

There are engine waste manufacturers now who turn out as much as 30 tons a day. The chief customer, of course, is the government, which buys by first receiving sealed bids. It is not a question of the cheapest price, however, but a certain standard quality is demanded. The government never gives the whole order to one concern, but distributes it in lots of about 250 to 500 tons among all the engine waste mills in the country, so that almost every factory gets a fair share of the orders. The railway companies are, however, very strict in taking delivery of waste. The government also places very large orders for the requirements of the navy. In Germany, for instance, 800 tons of best white engine waste are consumed annually by the navy. Nothing in the shape of waste is too inferior for some purpose or other. Even when the engine waste has done its services, it is not thrown away, but is accumulated in big iron barrels and sold again to engine waste makers where it came from. The greasy waste is then put in a centrifugal, which machine extracts the oil from the waste. This oil is bought by oil mills, who use it in the manufacture of cheap oil and grease, the remaining waste is dried and

then dyed blue or black and mixed at the rate of about 10 per cent. at a time in the blends of cheap colored engine waste.

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TENDERNESS IN WORSTED LININGS

BY JAMES STRAND

A manufacturer who sends a sample of a cheap cotton warp lining asks what the reason is of a tenderness which his goods develop after crabbing. The sample is of light weight (stated to be 3 ounces per yard) and twill weave with a light worsted filling. The flatness of the filling threads the papery handle and the stone pipe polish tell their own tale of the severity of the treatment to which the fabric has been subjected in the endeavor to bring up a smart appearance. The sample sent is not tender, but the wool has been made somewhat brittle. So far as may be seen the wool used is not the most suitable for the purpose. Presumably the manufacturer has been working to a price and aiming at making the cheapest wool-filled lining possible. The filling yarn is single and includes fibers of very different lengths and qualities, ranging from 50s crossbred down to coarse hairs such as are not usually met with except in britch tops.

No doubt the yarn in its original condition was fairly strong, but all yarns, worsted or cotton, lose strength in crabbing. By repeating the process often enough any light worsted can be made rotten. Dyers of government goods are under no illusion on this point. In Yorkshire they receive cloth (for example, worsted shalloons) which the manufacturer has contracted to supply rather too cheaply. The dyer has to crab them to prevent the formation of crimps in dyeing and this process weakens them. If they are treated any more than is necessary they are further weakened. The strength-testing machine finds the weakness out and the goods are thrown on the commission dyers' hands. Heat and pressure applied in one form or another in the finishing of Bradford lining cloths weaken the original texture by 40, 50 and 60 per cent.

To prevent tender goods it is advisable to use yarn that is strong and to make that yarn out of a grade of wool which will show off its luster with a minimum of handling. Cheap luster linings in Bradford are made with 30s or coarser for filling out of the long luster wools—Lincoln, Yorkshire and Devon. The superior linings are made of alpaca and these have the initial margin of strength to resist what dyers call "Italian" crabbing and have the necessary natural lustrous nature. "Italian" crabbing means tight winding and much steaming and boiling, as required in the case of the familiar Italian lining cloth.

It has been hinted that crabbing is not the only process detrimental to strength. Perhaps damp pressing is worse and there are indications that the sample submitted has been heavily pressed. Moistening or steaming, followed by hot pressing, introduces in an aggravated form all the forces which destroy strength in the crabbing machine. In obtaining what is called the permanent finish, which withstands wetting-out in hot water, there is a long succession of steamings and pressings. The finish advertised as "Kirk's Permanent" is understood in the trade to consist of crabbing, singeing, dyeing, steaming and pressing. Of course no low quality of cloth ought ever to be subjected to this four-fold action of pressure and steam. A less durable finish worked in Yorkshire involves crabbing, singeing, dyeing, crabbing, steaming and pressing.

On wetting-out in nearly boiling water and then drying a portion of the sample in point, it is discovered that the press-finish disappears and to a certain extent this goes to confirm the manufacturer's statement that the crabbing is the origin of the tenderness. He may use less pressure and less steam on the crab and save strength in that way, but this may involve him in loss of luster.

For such interest as they may have I sent four patterns of luster linings made by a Bradford firm; the cheaper ones of luster wool, the better of alpaca. The cheapest is not the lowest that could be made, but is the lowest quality for which there is a regular demand. The American pattern is quoted 25 cents in 32 inches. The Bradford makes are 54 inches and are quoted 29 1/2, 32, 34 and 42 cents and there are very material differences between them and the American in point of weight, quality and durability.

Correspondence and Notes

UPON TEXTILE TOPICS AT HOME AND ABROAD

FRENCH WORSTED SPINNING

BY ROBERT DANTZER

(Translated from the French by the Editor of the Textile World Record.)

(Continued from April)

GILLING BEFORE COMBING

The wool sliver becomes slightly matted during the passage through the backwasher and fine places occur as a result of the draft and tension. It is to overcome these defects that the stock is run through two gill boxes before combing. The fibers are opened up and the sliver made uniform where the fine places occur. An excellent gill box for this purpose is made in England in which the pressure on the rollers is obtained by means of springs. A French gill box built by Skene & Devalle, Roubaix, has two deliveries or heads, each of which is supplied with two slivers, making four ends fed to the machine. Fig. 7 shows the Peli gill box built by the same firm. The fallers are arched. This machine can be used in place of any of those that we will describe later. It is supplied with four balls and has two deliveries. The draft is usually made about equal to the doubling. For example, if three ends are fed to each delivery the draft would be 3 1/2 at the most.

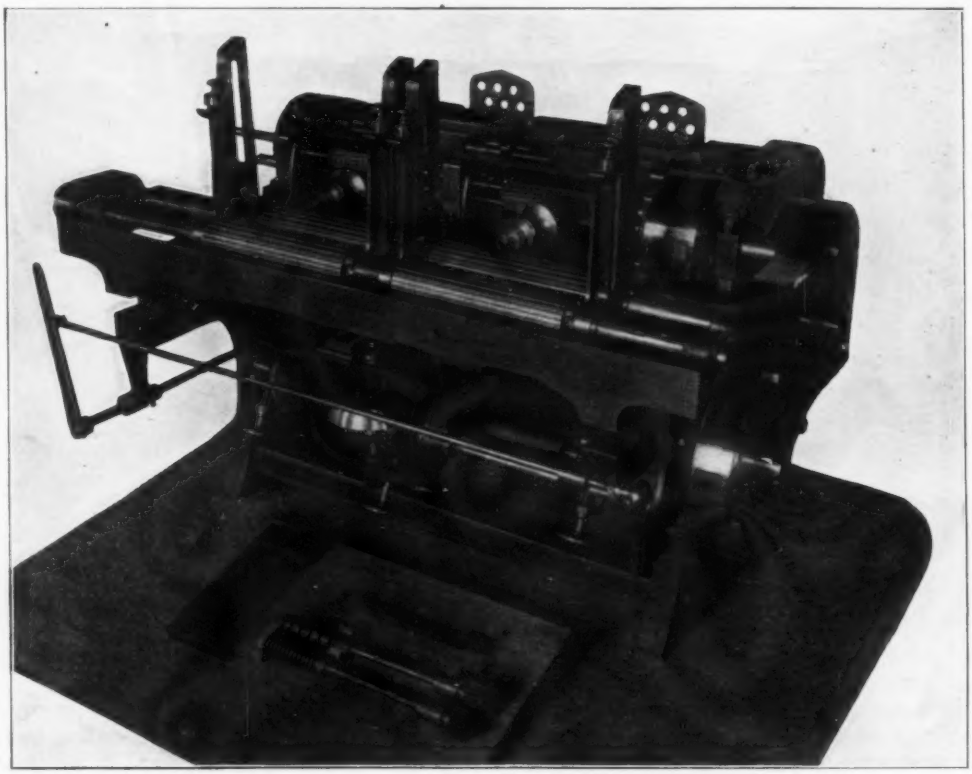

FIG. 7.

Second Gilling Before Combing. The same type of machine can be used here as for the first gilling. A machine known as the

bi-parallel gill box, shown at Fig. 8, is sometimes used at this stage of the process. It has recently been introduced and is more expensive than the ordinary gill box, nevertheless there is a tendency for it to displace the latter. The principle of this machine will be described later. The second or finishing gill box is run with a variable amount of draft which is adjusted to make the sliver of the

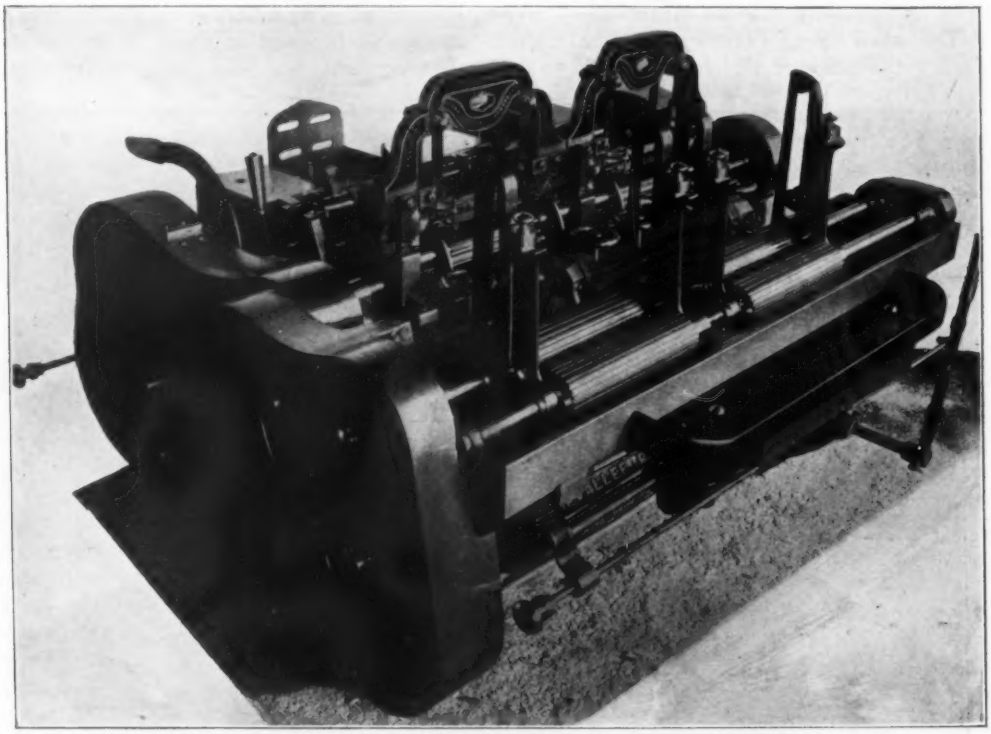

FIG. 8.

weight required for combing. For merino wools the sliver delivered to the comb should weigh about 125 grains per yard.

COMBING

The process of combing has two objects: (a) to obtain a clean fiber, (b) to separate the short fibers from the long. These objects are attained simultaneously. The vegetable and other foreign matters in the wool are thrown out at the same time that the short fibers are separated from the long. The last named form the sliver of top and contain all of the fibers above a certain length. The rejected fibers, called "noils," comprise all fibers less than a certain length, and in the noils are the various impurities found in the wool. Combs are divided into two general classes: (1) Those combs with intermittent draft, including the Heilmann type, known as the French or rectinilear combs; (2) the combs with continuous or circular draft which are used for the Bradford system. The rectinilear combs are divided into two classes according to the method of drafting: (A) Combs in which the draft is effected by leather segments and finely corrugated rollers. In this class are included the Schlumberger, Delette, Meunier and Offermann combs. The draft is effected in two ways: (1) Drafting by friction, by rotation of the drafting roller and the leather covered segment, (2) drafting by friction by oscillation of the drafting roler and of the delivery sleeve. (B) Combs in which the draft is effected by two large corrugated spiral cyl-

inders with sleeve interposed. In this class are included the various types of Offerman and Ziegler combs. These combs exhibit two periods of drafting: (1) Drafting by successive drawing of the fibers, (2) drafting by friction of the projecting fibers drawn by the oscillation of the drawing rollers and their sleeve.

The cycle of movements in the intermittent combs can be divided into five principal functions: (1) Formation of the free end of the sliver, (2) combing the end of the sliver, (3) breaking the sliver and combing the projecting fibers, (4) forming the top sliver, (5) removal of the noil and dirt. The various types of alternating combers are all based on the principle of the Heilmann comb. They differ from the Heilmann machine and from each other by reason of various improvements which have been adopted either to produce a cleaner top or a larger production. F. J. Gruen, of Lure, has built several types of the Heilmann comb, including the Meunier, Meunier-Gruen and the Offerman-Gruen. The Delette-Gruen is the latest type to be added to the list. The 1907 model, shown at Fig. 9, is in operation in a number of French, German and Spanish mills. This comb is suited for wool, ramie and flax waste and combines all of the improvements that have been made during the development of the Heilmann comb. It yields a large production and a very clean top, the sliver being compact and regular. It is suited for wools varying greatly in length, but nevertheless involves but short movements which results in very slight wear on the parts. The top obtained from this machine is suited for working by either the Bradford or French system. A large combing cylinder is used, it being 6 inches in diameter. It carries 13 barrettes and is operated continuously. The end of the sliver is forced into each barrette by a circular presser similar to that on the old Delette comber, this accounting for the cleansing action of the comber. The combing of the fiber is effected in the ordinary way across a fixed comb which is operated in connection with a plate in such a way that no fiber underneath can escape the action of the comb. The production of a comber depends on the length of the sliver submitted to the combing process. This length depends upon the distance between the combing cylinder and the jaws holding the sliver. The axis of the combing cylinder is stationary; the jaws holding the sliver are movable, but oscillate in a very small arc. The drafting carriage oscillates so as to approach the jaws and seize the projecting fibers.

The length of the fibers which can be handled by the machine depends upon the

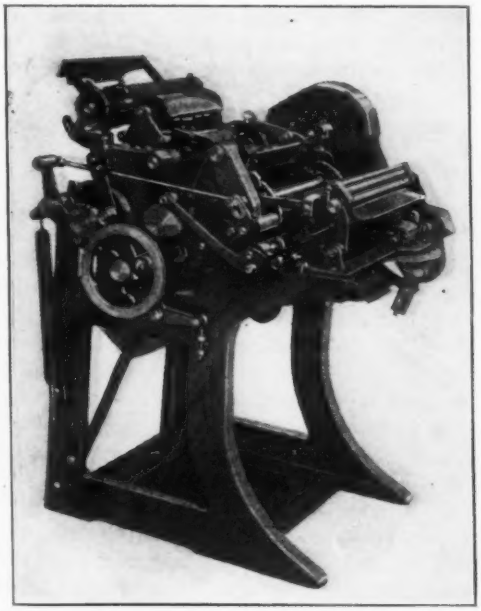

FIG. 9.

length of the draft, which is produced by the rotation of the cylinder and completed by the descent of the hook. The drafting rollers are driven by a sector which has an alternating movement that imparts an alternating motion to the rollers for drafting the fibers and for the return. The movement can be regulated by adjusting the eccentric. This enables the motion of the rollers to be adjusted to the length of the fibers, giving a very uniform web.

The large production of the machine is due (1) to the width which is 13 inches at the feed rack, 15 inches at the combing cylinder and 18 inches at the drafting sleeve; (2) to the speed of 95 to 100 strokes per minute, (3) to

the progressive arrangement of the drafting motions.

The Offermann-Ziegler Comb. In this machine the drawing rolls are stationery, the system consisting of the nippers, the top comb, and the feed which approaches and recedes from the cylinder in order to produce the draft. The segments of the comb consist of the Heilmann type of heckle bars. The production of this machine can be increased because the cylinders are driven directly from the main shaft and means are provided for obtaining friction on the leather sleeve, thus increasing the power of the draft. A very thick feed can be used on this machine. The power is applied by a combination of cranks instead of eccentrics and as a result the movements of the parts are free from shock, besides being very rapid. The construction of the machine is shown plainly by the section plan, Fig. 10.

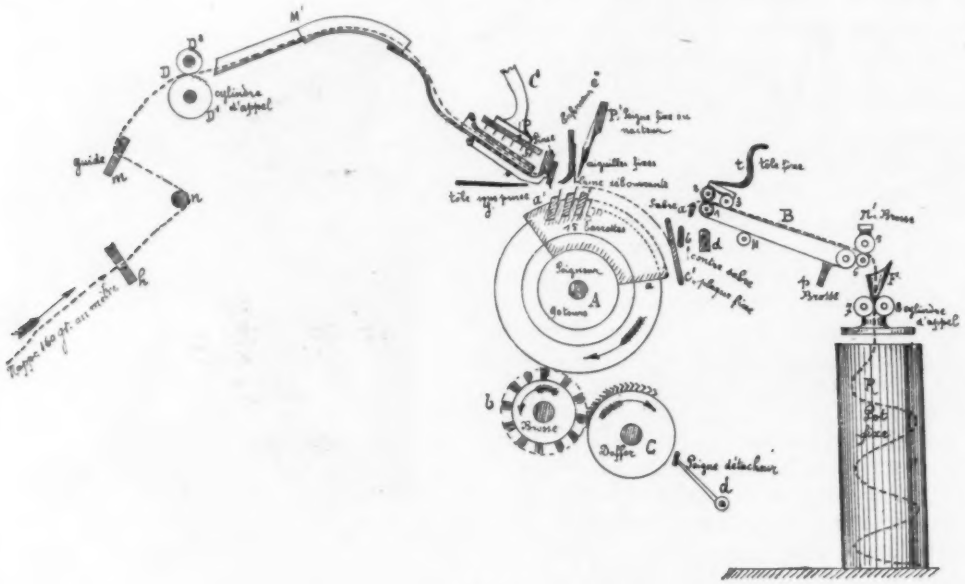

FIG. 10.

(To be continued.)

The quantity of cotton imported into the United States during the six months period ending February, 1910, was 46,889,109 pounds, equivalent to 93,788 bales of 500 pounds each, valued at $8,500,875.

DUSTLESS DUSTERS

Editor Textile World Record:

Can you tell us what chemicals are used in the manufacture of the so-called "dustless dusters"?

Adams (1897).

I find on examining the sample that it is an unsized cotton muslin, woven from single yarn, and dyed with aniline black, although for this class of fabrics where shade is not particular, the sulphur colors could be used without any difficulty. The dustless quality of the cloth is imparted to it by impregnating the fabric with a mineral (paraffin) oil. The exact oil used is impossible to readily determine from the small clipping of cloth sent. It is possible, however, that a paraffin oil ranging from 28° to 24° gravity has been used. The amount of paraffin oil absorbed by the cloth is very little, but as it is applied to the cloth while the latter is in a dry state, this small amount of oil is rapidly taken up by the cotton by capillarity.

Berwick.

The quantity of artificial silk used in the United States in 1899 amounted to 6,000 pounds, compared with 876,000 pounds in 1909.

ENGLISH NOTES

By Our Special Correspondent

Sixteen cotton spinning mills whose returns for the last three to six months have been published show a profit of a shade over 5 1/2 per cent. Cotton spinning gets worse rather than better, but cotton weaving has very much improved. Lancashire looms are engaged practically for the rest of the year and at remunerative prices. New weaving sheds are being projected, principally in the districts where printing and finishing cloths are made. Business is slack in heavily-sized grays, but in no other department and neither long deliveries nor high prices have deterred the placing of large orders for India, China and South America.

The dress goods business is the only slack branch in the worsted industry and manufacturers expect a revival in it to judge from their purchases of yarn. In contrast to cotton, it is the spinners who are making most money out of worsteds. The carded woolen trade is strong in all districts. The Scotch makers are busy with cheviot mixtures showing only a faint design and are making greys principally, although warm brown tones are proving popular. Blue serges have replaced some fancies in the fine worsted trade and the weaving branch of the latter is now threatened with a strike. The Huddersfield weavers, who are the best paid and most capable workers in their own line, are pressing for a 55-hour week and 15 per cent. advance in wages.

* * *

The acquisition of a Mississippi cotton estate by the Fine Cotton Spinners' & Doublers' Association has been approved on all hands as a wise measure. The cotton produced is just the sort the Association wants and the first choice of 15,000 to 20,000 bales of staple American is a matter of importance to a concern spinning yarns of which the quality is the first consideration. The Association owns nearly fifty mills, consumes almost the whole of the Sea Island crop and a large part of the Egyptian. Its business is largely in 80s counts and finer and with its many mills and large colliery in Lancashire, its two mills in France, its plantation in America, its cotton buyng and storage house in Alexandria, and cotton broking and importing offices in this country, the association can properly be called a widely ramified affair. Among its chief customers are J. & P. Coats and the English Sewing Cotton Company. Coats several years ago took $1,000,000 of Fine Spinners' shares. At its formation the Association was undoubtedly over-capitalized, but the stock-market does not think badly of the security now. Common stock stands at 65 per cent. premium, preferred at 15 per cent and debentures at 1 1/4 per cent.

The plantation is to be owned by an American company with Lancashire representation on its board. The Fine Spinners are retaining $3,000,000 of the plantation company's bonds and issuing scrip of their own to finance the transaction. Their shareholders are offered $2,500,000 worth of 5 per cent. preference stock at 10 per cent. premium and $1,250,000 of ordinary at a premium of fifty per cent. This brings the issued capital of the largest concern in the British cotton spinning industry up to $41,250,000 face value.

* * *

A distinction must be drawn between paper yarn, formed by slitting and twisting sheet paper and pulp yarn manufactured direct from cellulose or pulp into strips ready for spinning. The latter is the type which has been attracting most attention lately and which, according to C. P. Hellburg, an inventor, can be made at a labor cost of $12.50 per gross ton, as against $21 by the former pocess. Pulp yarn made by the Kron system and known as "Silvalin" is to be manufactured in England in a new factory near Manchester where machinery to make 8,000 tons a year of yarn averaging 800 yards per pound is presently to be installed. The projection of this factory may be included among the fruits of the Lloyd George Patent Act which makes "compulsory working" a condition of the validity of British patents.

The published informaton about pulp and

paper yarns is of a one-sided character, consisting largely of accounts of the wonderful things which can be done with the new materials. Very little is heard of what cannot be done, although it is evident that yarn averaging about 1s cotton is unsuitable for a large number of purposes. All experience tells that goods whether raw or manufactured have only to be cheap enough and abundant enough in order to be used and the case will be the same with this as with all others. One argument, disparaging the chances of paper as a material for weaving, is that paper is dead, sad, heavy stuff and that what people really want is free, light, lofty material. The same has been said and not without justice, of ramie and of marine fiber. Like many new things paper yarn is suffering slightly from an excess of virtues. The good points are more numerous than can be immediately accepted and it has not won to such a position yet in English textile favor as—for instance—artificial silk. The matter may be only one of time, for the recognition of pulp silk as a standard material is of very recent date.

* * *

Lancashire spinners have been driven into a new interest in humidifying and dust-extracting plant by the insistence of the Government on the creation of a purer atmosphere in cotton card rooms. A joint committee of operatives and employers has been viewing different forms of apparatus, approving some and disapproving of others. Determined not to lose their voice in the matter, the card room hands in two or three mills have struck work rather than see apparatus installed which they considered ineffective or cumbersome. A mill manager lecturing on the subject blames the more modern types of flat cards for aggravating the dust evil and points to belts, pulleys and flyers as the means by which short fiber is kept dancing in the air. Both the breakage of fiber and the circulation of dust being facilitated by the dryness of the atmosphere, the use of humidifiers is advocated. In the case of one firm a reduction of 2 per cent. in the "invisible loss" followed the introduction of humidifiers into the card room. The kind of cotton used is not stated.

Mr. Joseph Jones, the manager in question, laid down some general conditions which apparatus for this purpose ought to fulfil. The humidifying plant should produce an agreeable atmosphere in which fresh air and humidity were combined. The dust-removal plant should be simple, fool-proof, low in cost of maintenance, and make no extra demands upon the attention of the operatives. It should remove the dust and fluff given off in ordinary working and prevent the dirt from settling on the preparation machines. It should be effective during the operation of stripping and particularly during grinding; and it ought not to be needlessly ugly in appearance. The remarks were in the nature of hints to inventors.

* * *

Inquiry is being made in England for cotton-warp worsted Italian cloths for two apparently novel purposes. In one case the cloth is wanted for the face-fabric of sheepskin coats. These coats made from sheep pelts with the wool turned inside, are worn in some of the colder countries, and it is believed that a smart Italian cloth, proofed against rain, would make a popular finish. The further idea is to make leggings of such Italians or lastings as are now used for shoe tops and corsets. The leggings are presumably to be backed with fur or jute stiffeners, but as to this nothing is definitly known.

* * *

The smallpox-in-cotton scare having died down, a movement has been found for diverting attention from bacteria to beetles. Why have beetles, or necrobia as the zoologist calls them become a conspicuous impurity in bales of raw cotton from Egypt? It is not alleged that they are added for the sake of making weight. So far as their origins have been traced, the presence of the insects is explicable by methods of stowing on shipboard. The bales are brought into contact with hides, dried blood or other animal matter and larvae from the hides enter the bales, make their way six or seven inches deep and there go into the cocoon stage. Be-

yond creating excitement they can do little harm; but this does not amount to an argument in favor of stowing noisome animal substances in proximity to good cotton.

An interest not strictly textile attaches to botanical as well as biological impurities lodged in the raw materials of textile industry. Thus a Bradford man has cultivated quite an interesting garden out of seeds extracted from wools imported into this country. There is no saying that study of these results may not become practically valuable.

* * *

An experiment with vegetable stuff more directly to the point has been made by a manufacturer of low carded woolens. Observing that the first warm days of spring regularly brought to the surface of his mill pond a green fibrous scum or moss,—noting that the fiber was long and fine, reflecting that it was cheap and convenient and might be made abundant—he ventured on an experiment. The dam was skimmed, the green stuff was dried and used in conjunction with woolen waste on the cards. It is regrettable to report that the result was a failure complete enough to discourage any second attempt. The wonder and amusement created in the town of Pudsey by this bold essay whetted local interest in a further endeavor on the part of the same enterprising person to turn a seaweed fiber to good account. A cheap, coarse cloth has been made out of the fiber of which I enclose a small sample, but the results do not encourage the manufacturer to continue using it. The material closey resembles "marine fiber" (Paseidonia Australis), of which a sample has been previously sent, and is apparently the backbone of marine vegetation from which the gluten has been removed by processes of decay.

MATT WEAVES

BY WEBEREI

The use of matt weaves in the manufacture of gray shirting and waist fabrics is practically unlimited and though many of the weaves employed are of a simple character there are a number which present interesting features. Matt weaves for the purposes mentioned above are almost invariably woven from gray yarns, being subsequently bleached and marketed as white goods; in some cases the material is mercerized in the piece, giving excellent results.

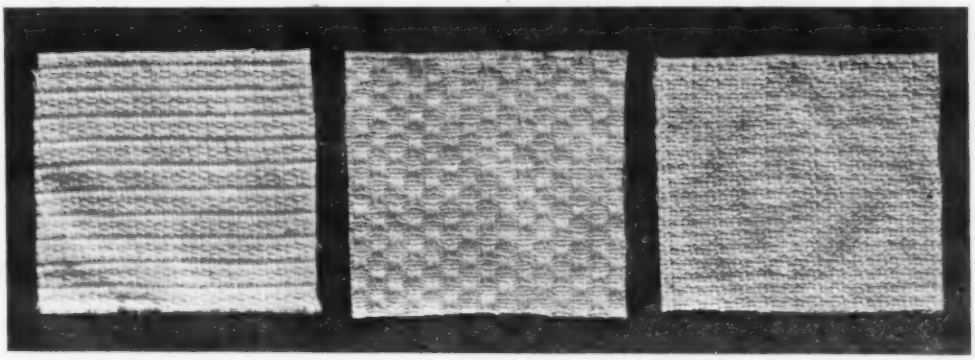

FIG. 3. FIG. 4. FIG. 5.

The simple matt weaves are practically adaptations of the plain weave, but it is to such weaves as are illustrated at A, B and C, Fig. 1, that attention is specially drawn. The two weaves, A and B, give excellent results when woven to the following particulars:

Warp, 50 threads per inch, 22s.
Weft, 32 picks per inch, 8s.

A slightly better quality suitable for mercerization in the piece would contain 60 warp threads of 20s per inch and 56 picks of 12s

per inch. Fig. 2 shows the class of fabric produced from the design given at C, Fig. 1. This is a very successful shirting fabric and is made from about 75 warp threads of 20s

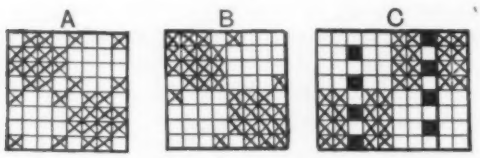

FIG. 1.

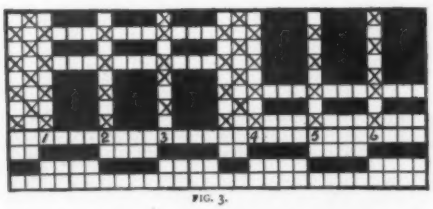

FIG. 3.

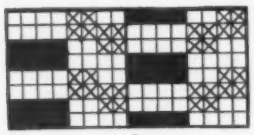
FIG. 8.

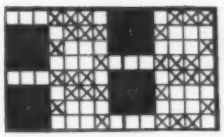
FIG. 6.

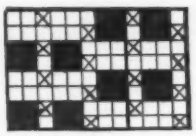
FIG. 10.

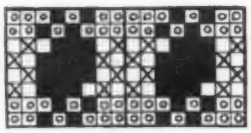
FIG. 12.

single and 2/80s warp per inch and 50 picks of 10s filling. In the design the single warp yarn is indicated by crosses and the 2/80s yarn by filled in squares. The reeding is 3, 2, throughout, that is in one dent there are two threads of 20s along with a thread of 2/80s and in the next dent only two threads of 20s.

The most effective matt fabrics, however, are those which contain mercerized yarn of which a few examples will be given. The design shown in Fig. 3 was used in the production of the cloth illustrated at Fig. 4. The filled in squares represent mercerized warp yarn on the face of the cloth while crosses indicate the lifting of the ordinary warp yarn. Special attention is drawn to the working of the threads that are numbered. Threads 1, 2, 4 and 5 weave alike in plain order, but threads 3 and 6 do not weave plain. Although this necessitates the use of an extra heddle it is essential if a firm and compact binding of the weft behind the mercerized stitches is desired. Woven in a reed with 32 dents per inch, dented as indicated in the design, with 2/60s mercerized and 32s ordinary warp yarn and having 48 picks of 12s per inch, a good serviceable fabric results.

Fig. 5 is a neat mercerized stitch matt woven from the design given at Fig. 6. In this case the mercerized yarn weaves in groups of three threads which are drawn in one dent. Between each group of mercerized threads are four cotton threads drawn in two dents. The mercerized yarns weave $^{3}\!-\!_{1}$ while on each side is a single thread weaving plain and in the center is a tape weaving $^{2}\!-\!_{2}$. The cloth is woven with 2/60s mercerized and 30s ordinary warp yarn in a reed with 36 dents per inch. The filling yarn is 14s woven 42 picks per inch. This cloth is, however, but a lower quality of the fabric illustrated in Fig. 7, in which the mercerized warp yarn comes up more boldly. In this case the mercerized warp is placed on a separate beam and is woven with less tension than the cotton warp. The design as shown in Fig. 8 is based on the $^{2}\!-\!_{2}$ weave and the cloth is reversible. The warp yarns of 2/40s mercerized and 20s ordinary and the filling is 12s. The warp is drawn two threads per dent in a reed having 30 splits per inch, and woven with 40 picks per inch. The lengths of the two warps should be in the proportion of 9 yards mercerized to 8 yards ordinary in order to obtain a good covering cloth.

Another high quality reversible fabric is shown at Fig. 9 in which a large proportion of mercerized yarn is used. The weave is given in Fig. 10, from which it will be seen that the mercerized warp threads, which

weave in tapes, are worked 2 up 2 down. The ordinary cotton threads weave plain and a strong, well bound fabric results. The weaving particulars for this cloth are as follows: Reed: 36 dents per inch, 3 threads per dent. (2 of 2/60s and 1 of 30s single); 40 picks per inch of 2/20s mercerized filling.

A novelty in this class of cloth is shown in Fig. 11, which is a check design. The solid

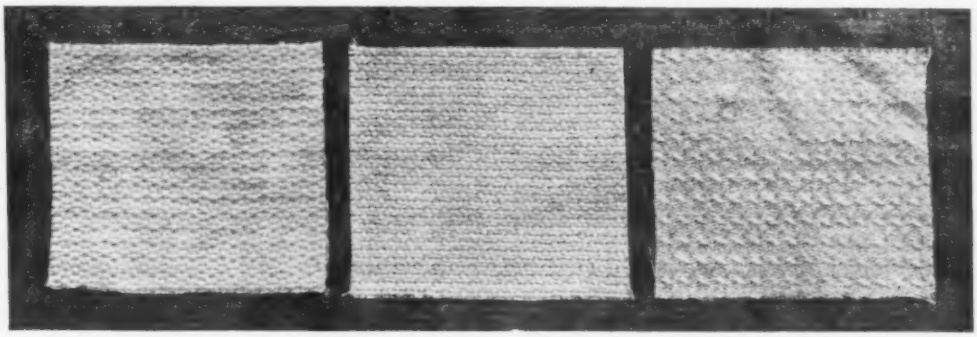

FIG. 7. FIG. 9 FIG. 11.

squares in the design given at Fig. 12 show mercerized warp yarn on the face. The circles indicate mercerized filling on the face. The crosses indicate the weaving of the ordinary cotton warp. The warping and filling are arranged four and four of mercerized and ordinary cotton respectively and a very effective cloth results. The warp and filling are of 2/60s mercerized and 30s ordinary with 64 threads per inch and 60 picks per inch.

WASTE IN THE CARD ROOM

BY WESTON

The waste produced in the woolen card room may be divided into four classes, which should be kept entirely separate, as they vary in quality and condition, and require different treatment in order to be profitably disposed of. The first and best is that which comes direct from the delivery end of the machines, constituting the roving and roping waste coming from breakdowns and changing of lots, starting up, etc. This waste, being entirely free from dirt, has lost none of its original value, in fact it is rather enhanced in value by reason of the elimination of dirt and dead fibers that drop out in its passage through the whole or a part of the process. A part of this waste, by being properly broken up, may be put back into the first breaker feed, and thus restored to the lot. But a better way, where it can be done, is to put it aside to be added to a lot of similar mixture later on, as it is then broken up and put into better condition for feeding, by its passage through the picker with the other stock. Care should be taken to gather up this kind of waste as soon as it is produced, and not allow it to be kicked around the floor and become mixed with other kinds and colors, thereby reducing it to the next lower and less valuable grade.

The second class of waste is not very different in quality from the first, but cannot be as profitably disposed of at the mill on account of its being a somewhat random mixture, usually requiring to be redyed before it can be profitably used again. It consists of stock which accumulates on and about the machines, together with such of the first class which becomes mixed with other colors and mixtures. This kind of stock cannot be well used without redying, except in goods to be piece-dyed, for which reason it is best kept by itself. By a careful looking after the first class, this kind may be kept at a minimum; and care should be taken to keep it clear from foreign substances, such as broom corn, floor dirt and especially any bits of metal, so that it will be in good condition for the picker when required. A

careful discipline as to order and cleanliness will accomplish much toward keeping down the accumulation of the two classes of waste already mentioned.

The third class of waste which we will speak of is such as accumulates beneath the machines, and is often referred to as flyings. This is of less value than either of those already spoken of, but should by no means be neglected. It contains much dead and inferior stock, such as kemp and injured fibers and is usually loaded with foreign matter, such as seeds, burrs and other dirt that the wool contains. It is best to keep each mixture of this stock by itself, and to give it a thorough dusting, removing all the dirt possible, after which it should be marked to distinguish it. As to its use, much depends on the good judgment of the superintendent, who should be able to determine the matter; but it should be remembered that it contains much inferior stock, and it cannot be put back into other lots without adding to the percentage of poorer fibers that must prove a menace to good work, as well as to tend to lower the quality of the goods to be made.

Unless the mill is making some goods of low grade, where this waste can be used to advantage, it will be best to sell it for what it will bring, and thus get rid of what would otherwise prove a detriment to the product. In some mills recent inventions have been introduced to prevent the dropping out of the fibers, with good results, so that only the dirt and worthless fibers accumulate beneath the machines. In such cases the waste is of very little value, and it is for the superintendent to determine what to do with it. With the high speed at which woolen cards are run today, there is considerable good stock mixed with this waste, and anything that will insure its passing through the card and into the yarn is worth while.

The fourth class of waste comprises the strippings, or such as comes from the cleaning or stripping of the cards. This is usually heavily loaded with a combination of grease, dirt and shives; and although it always contains some of the best fibers of the stock, it contains such a large percentage of grease and dirt that the profitable use of it is quite out of the question. To attempt to mix it with the regular stock only adds to the quantity of dirt to contend with as the work proceeds; and it is advisable to sell it for what it will bring, and count it a gain to get it out of the mill.

By a system of cleanliness and care in keeping the different grades separate, and using the waste judiciously, much loss may be avoided. Where there is a lack of care and system, and the poorer waste becomes mixed with the better, the value of the latter is depreciated, either for use or to sell. By using the first two grades as designated and disposing of the other two, at the best possible price, an undue accumulation of waste of doubtful value will be avoided, and the work in the room will be kept at its best. The fact that any part or all of the waste is to be sold, is no excuse for allowing it to be carelessly mixed. As a rule the man who buys the waste is a better judge of its value than the seller, and when he knows that it has been carefully assorted, he can better estimate its value, while on the other hand he will take no chances on stock that is a conglomerate mixture of waste, dirt and junk.

Where wool and cotton are worked separately, it is best, if possible, to keep them separate in the waste, as any suggestion of cotton will at once place the stock at a lower value than if strictly all wool. Where the waste question is properly considered and well looked after, it is noticeable that the concern is generally prosperous; not altogether on account of the saving in the matter of waste, but because, where there is care and system in this which is apt to be considered a lesser matter, the more important interests are equally well attended to; and the manner in which the waste is kept is likely to be a pretty safe barometer of the business sense of the man at the helm. Careless methods in this matter bespeak a lack of oversight of other details that tend to a loss to the mill.

The exports of cotton manufactures into the Philippines from the United States amounted to $2,936,398, as compared with $1,059,042 for 1909.

Questions and Answers

Under this head we undertake to answer, free of charge, to the best of our ability, questions pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

If the question is not of general interest to textile readers and involves expensive investigation, a charge covering the cost may be made, of which the inquirer will be advised before any expense is incurred.

CLOTH CROCKING

Editor Textile World Record:

I enclose a sample of cloth that crocks. You will notice the dust flies at point of rupture when cloth is torn. The sample is from a piece that was returned to us and which has been scoured a second time, then sent to the dye house and chromed with 3 per cent. bichromate, 3 per cent. oxalic acid. It still crocks as you will see. The goods were dyed as follows:

15% Glauber's Salt, necessary dyestuffs.
5% Acetic Acid, boiled ¾ of an hour.
3% Sulphuric Acid, boil ¼ of an hour.
1½% Bichrome, boil ½ hour.

Kindly give us the cause and remedy for this crocking. Anderson (1912).

Though this sample of cloth shows a considerable amount of dust that flies when the piece is torn, yet it does not show any very great degree of surface crocking when the cloth is rubbed on a white handkerchief. The cause of this trouble is due to the second scouring of the piece, when it is probable that all of the soap was not taken out before it went to the dye house the second time where it was treated with chrome and oxalic acid. This caused a precipitation of insoluble metallic soap within the cloth, and this causes the crocking and the dust. This is a hard thing to get rid of in such a fabric as that submitted, but it could perhaps be best overcome by giving the cloth a good brushing and a slight gigging.

Another suggestion would be to treat the cloth with a warm dilute solution of muriatic acid (about 1° B.) so as to break up the insoluble metallic soaps, then wash well, and afterwards give a slight scouring. This method, however, has to be carried out carefully, so as to remove all of the acid before the scouring is given, otherwise the cloth will revert to its original condition. The scouring should best be done with a small amount of soda ash or sal soda.

Hertford.

CARBONIZING PIECES

Editor Textile World Record:

What apparatus is advised for carbonizing woolen cloth in the piece? Xerxes.

In the English woolen districts where army goods and cheap piece-dyed woolens are made a good deal of carbonizing is done after weaving. There are commission carbonizers who do this work exclusively and some of it is done by commission dyers. The plant requisite consists fundamentally of a tank for the acid and of a means of drying the fabric after steeping, in order to clear out the vegetable matter. It is difficult to say what plant is advisable without knowing on what scale the work is to be carried on and without knowing what plant is already in Xerxes' possession. Tenter frames in a hot-air chamber serve to dry the cloth very well and to keep it out to the desired width. They may suit one set of circumstances. If it be desired to have a continuous process and to treat a large quantity of cloth day in and day out, a cylinder drying machine with copper cylinders is a desirable investment. It is not absolutely necessary that all the cans should be copper, but the first six or eight ought to be. If, on the other hand, the necessity for carbonizing only arises occasionally and a cylinder drying machine is already possessed, the iron cylinders can be protected by covering them with blanket.

As the acid rather assists dyeing it is not usual to neutralize the fabric in Yorkshire before proceeding further. The process is followed to get rid of material which will not take wool-dye and piece-carbonizing may be used to produce special effects. Thus a mohair single thread may be twisted with a cotton thread, and so woven, and after weaving the supporting thread may be removed by carbonization, leaving the animal material

careful discipline as to order and cleanliness will accomplish much toward keeping down the accumulation of the two classes of waste already mentioned.

The third class of waste which we will speak of is such as accumulates beneath the machines, and is often referred to as flyings. This is of less value than either of those already spoken of, but should by no means be neglected. It contains much dead and inferior stock, such as kemp and injured fibers and is usually loaded with foreign matter, such as seeds, burrs and other dirt that the wool contains. It is best to keep each mixture of this stock by itself, and to give it a thorough dusting, removing all the dirt possible, after which it should be marked to distinguish it. As to its use, much depends on the good judgment of the superintendent, who should be able to determine the matter; but it should be remembered that it contains much inferior stock, and it cannot be put back into other lots without adding to the percentage of poorer fibers that must prove a menace to good work, as well as to tend to lower the quality of the goods to be made.

Unless the mill is making some goods of low grade, where this waste can be used to advantage, it will be best to sell it for what it will bring, and thus get rid of what would otherwise prove a detriment to the product. In some mills recent inventions have been introduced to prevent the dropping out of the fibers, with good results, so that only the dirt and worthless fibers accumulate beneath the machines. In such cases the waste is of very little value, and it is for the superintendent to determine what to do with it. With the high speed at which woolen cards are run today, there is considerable good stock mixed with this waste, and anything that will insure its passing through the card and into the yarn is worth while.

The fourth class of waste comprises the strippings, or such as comes from the cleaning or stripping of the cards. This is usually heavily loaded with a combination of grease, dirt and shives; and although it always contains some of the best fibers of the stock, it contains such a large percentage of grease and dirt that the profitable use of it is quite out of the question. To attempt to mix it with the regular stock only adds to the quantity of dirt to contend with as the work proceeds; and it is advisable to sell it for what it will bring, and count it a gain to get it out of the mill.

By a system of cleanliness and care in keeping the different grades separate, and using the waste judiciously, much loss may be avoided. Where there is a lack of care and system, and the poorer waste becomes mixed with the better, the value of the latter is depreciated, either for use or to sell. By using the first two grades as designated and disposing of the other two, at the best possible price, an undue accumulation of waste of doubtful value will be avoided, and the work in the room will be kept at its best. The fact that any part or all of the waste is to be sold, is no excuse for allowing it to be carelessly mixed. As a rule the man who buys the waste is a better judge of its value than the seller, and when he knows that it has been carefully assorted, he can better estimate its value, while on the other hand he will take no chances on stock that is a conglomerate mixture of waste, dirt and junk.

Where wool and cotton are worked separately, it is best, if possible, to keep them separate in the waste, as any suggestion of cotton will at once place the stock at a lower value than if strictly all wool. Where the waste question is properly considered and well looked after, it is noticeable that the concern is generally prosperous; not altogether on account of the saving in the matter of waste, but because, where there is care and system in this which is apt to be considered a lesser matter, the more important interests are equally well attended to; and the manner in which the waste is kept is likely to be a pretty safe barometer of the business sense of the man at the helm. Careless methods in this matter bespeak a lack of oversight of other details that tend to a loss to the mill.

The exports of cotton manufactures into the Philippines from the United States amounted to $2,936,398, as compared with $1,059,042 for 1909.

Questions and Answers

Under this head we undertake to answer, free of charge, to the best of our ability, questions pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

If the question is not of general interest to textile readers and involves expensive investigation, a charge covering the cost may be made, of which the inquirer will be advised before any expense is incurred.

CLOTH CROCKING

Editor Textile World Record:

I enclose a sample of cloth that crocks. You will notice the dust flies at point of rupture when cloth is torn. The sample is from a piece that was returned to us and which has been scoured a second time, then sent to the dye house and chromed with 3 per cent. bichromate, 3 per cent. oxalic acid. It still crocks as you will see. The goods were dyed as follows:

15% Glauber's Salt, necessary dyestuffs.
5% Acetic Acid, boiled ¾ of an hour.
3% Sulphuric Acid, boil ¼ of an hour.
1½% Bichrome, boil ½ hour.

Kindly give us the cause and remedy for this crocking. Anderson (1912).

Though this sample of cloth shows a considerable amount of dust that flies when the piece is torn, yet it does not show any very great degree of surface crocking when the cloth is rubbed on a white handkerchief. The cause of this trouble is due to the second scouring of the piece, when it is probable that all of the soap was not taken out before it went to the dye house the second time where it was treated with chrome and oxalic acid. This caused a precipitation of insoluble metallic soap within the cloth, and this causes the crocking and the dust. This is a hard thing to get rid of in such a fabric as that submitted, but it could perhaps be best overcome by giving the cloth a good brushing and a slight gigging.

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behind in a position in which it could never have been left except by this assistance.

Regent.

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WEIGHTING COTTON YARN

Editor Textile World Record:

Is there any way to weight cotton yarn in the dyeing with direct colors? Buxton (1899).

Cotton yarn may be weighed to a considerable extent when dyed with the direct colors by adding magnesium sulphate (Epsoms' Salt) to the dye bath, together with a small quantity of dextrin. Owing to danger of imperfections in the color, such as unevenness and cloudiness, it is perhaps better to use a separate bath after the dyeing for the purpose of weighting. This will be especially true if it is desired to weight to any considerable extent. The following process is a typical example of weighting cotton yarn which has been dyed with direct colors.

For 100 lbs. of cotton yarn use a bath containing about 160 gallons of water; add 100 lbs. of magnesium sulphate, 15 lbs. of dextrin, and 2 lbs. of glycerine. Have the temperature of the bath at about 120° F. The cotton yarn is entered into this bath and turned for 20 minutes, or until the fiber is thoroughly saturated with the solution. It is then removed, hydro-extracted and dried. Such a treatment as this will give a weighting of about 10 to 12 per cent. to the cotton yarn. The bath is by no means exhausted, and may be freshened up by the addition of a small amount of magnesium sulphate and dextrin till it is brought back to the same hydrometer test as at first, and succeeding lots of cotton may be treated as above. The glycerine is added for the purpose of preventing the weighting material from giving the fiber a stiff handle. Instead of employing glycerine a small amount of Turkey-red oil or soluble softener may be used. Soaps, however, cannot be employed in this connection, as they would be precipitated by the magnesium salt present, forming an insoluble metallic soap.

By this process of weighting, yarn which is dyed in even, bright and delicate colors may be successfully treated, as the weighting material does not add any color of itself to the yarn. Of other metallic salts, zinc sulphate has also been suggested as weighting material, as its presence furthermore is highly antiseptic and prevents the growth of mildew or the origin of fermentation in the cotton which contains it. Zinc sulphate, however, is more expensive than magnesium sulphate and is more or less poisonous in character, hence would be objected to in the majority of instances. Barium chloride might also be employed for weighting, but it is more expensive than magnesium sulphate, and furthermore barium salts are also poisonous. Calcium chloride is another metallic salt the use of which has been suggested for weighting cotton yarns, but this substance is so highly hygroscopic that it is difficult to understand how it could be used with advantage on cotton yarns, as it would absorb moisture to such an extent that when present in any considerable quantity on the yarn it would cause the latter to become damp and sticky.

This method of weighting yarns does not furnish a weighting material which is insoluble in water, hence the weighting would be easily removed if the yarn or the material in which it is to be manufactured is washed with water or scoured with soap. Furthermore, yarn weighted in this manner with magnesium sulphate, if scoured subsequently in the cloth with soap solutions, would furnish a very defective material, as the magnesium soap which would be formed by the action of the soap with the magnesium sulphate, is insoluble in water and is of sticky nature, so that it is very difficult to remove completely from the fiber. This will naturally lead to bad defects if a subsequent scouring operation is necessary.

In case the cotton to be weighted is dyed in black or in dull, heavy shades, such as blues or violets, a considerable degree of weighting may be obtained by treating the dyed yarn alternately with baths of sumac extract and pyrolignite of iron. This will cause the formation on the fiber of an insoluble tannate of iron, and the weighting thus obtained is of a permanent character. This tannate of iron, however, is of a black color, and so has the effect of darkening and

dulling the color which may be dyed on the yarn in the first place. The tannic acid of the sumac and the iron salt have the effect of making the fiber very harsh if any considerable amount of these materials are fixed on the cotton, consequently the amount of weighting in this case is rather limited. It is possible, however, by this means to obtain a weighting of about 5 per cent. without very materially injuring the quality of the yarn, if a small amount of glycerine or oil is employed for the purpose of softening the fiber and thus in some degree neutralizing the harshening effect of the weighting materials.

Howell.

As a general rule, cotton yarn is not materially increased in weight by dyeing with the direct colors. When dyed with the sulphur colors a slight increase in weight is apparent, while cotton dyed with the basic colors on a mordant of antimony and tannic acid, the increase in weight may vary from 1 to 5 per cent.

There is no practical method for adding weight to cotton yarn dyed with the direct colors, and any increase in weight desired must be applied in the form of certain chemical salts, of which the following are the most important for the purpose, viz: Epsom salts, sulphate of zinc, chloride of calcium, and chloride of barium. The increase of weight in some cases amounting to as much as 8 to 12 per cent. if solutions are used containing from 8 to 10 pounds of the substances per 10 gallons of water. A typical solution making use of Epsom salts is given below, which yields practical results. It is made as follows, for 100 pounds of cotton:

Water	gals	160
Epsom Salts	lbs	85
Dextrine	lbs	15
Rape Seed Oil	qts	2

saponified with

Soda	lb	1

If sulphur blacks are to be weighted in the above mixture, 12 pounds of sodium acetate are added.

The cotton to be weighted is simply immersed in the above solution, worked until thoroughly impregnated, and without washing, whizzed and dried. When moisture is to play its part in giving additional weight, a little glycerine is added to take the place of the oil and soda.

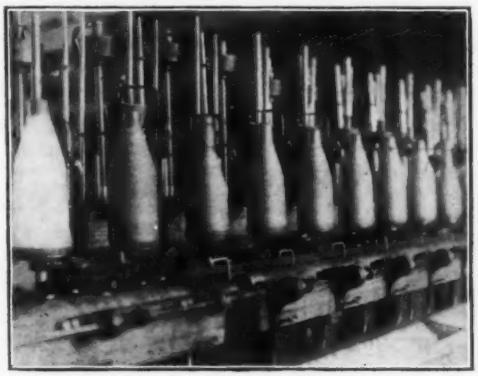
Black yarns are given increased weight by sometimes passing them through sumac and iron, and while a fuller shade is obtained there is always a tendency to crock.

Cromarty.

OILING YARN

Editor Textile World Record:

What is the most approved method of oiling the yarn before knitting? We have tried paraffining by hand, but it is too slow. We have tried oiling it with liquid petroleum and found it gave



OILING YARN.

satisfaction when we could get it on the yarn with any degree of uniformity. We used sight feed oil cups which dripped on to a sponge over which the yarn ran on the spooling machine. We found this satisfactory up to a certain point. The sponge would wear out and get clogged with dirt and we could not depend on the operators to keep the oil feed regulated properly. Is there no attachment for winders for oiling or waxing yarn in a satisfactory manner? Hastings (1288).

A good method of oiling is that of running the yarn over a roll which revolves slowly in a trough containing emulsion. The speed of the roll as related to the linear speed of the yarn, the size of the roll, the length of the yarn in contact with the angle of contact and also the height of emulsion in the trough are all determining factors as regards the moistening of the yarn. Jacob K. Altemus of Philadelphia makes automatic

paraffine waxing attachments for winders. The proper conditioning of the yarn is very important and the amount of moisture to be used should be determined by careful experiments. Undoubtedly one of the reasons why American made goods do not have the soft finish of the imported is because we do not often soften our yarns before knitting. No amount of labor in finishing will ever even the length of stitches which have been unevenly drawn in knitting. Elibank.

TWO THREAD KNIT UNDERWEAR

Editor Textile World Record:

We would ask you to give us your opinion of the following:

Our commission merchants tell us that winter union suits made in two thread will not sell as well as those made in single thread, that there are as many as twelve mills which made the single thread goods while only two mills made the two thread.

If we made two thread suits and put them on the market at a price which is a little higher, or at a price the same as the single thread, would these two thread goods sell as well as the single? As we look at it they ought to sell a good deal better for they are made of more costly yarn and the fabric would look better, and in fact they would be a better garment, but our selling agents say that such would not be the case. If the two thread goods will not sell as well as the single thread can you tell us why they will not?

Amsterdam (1913).

The all important requisite for a satisfactory union suit is that it shall fit a good proportion of the figures for which each size is intended. For a garment to fit a good proportion, it must have plenty of elasticity and it is here that the difficulty has been experienced in two thread garments. There seems to be a tendency for all two thread fabrics to be rigid and lacking in elasticity, especially if they are made of carded yarns. This characteristic is not so noticeable in goods made of two thread combed yarns.

We have talked with salespeople behind retail counters, who give it as their opinion that not three people in a thousand know what is meant when told that goods are made of two thread yarn. While it must be admitted they cost more and will wear longer we do not believe the sales agent or the manufacturer who make the inquiry, will be able to sell the goods at any higher price than asked for singe thread goods, even if it should be possible for him to make them just as elastic.

We understand that two thread yarn costs about three to five cents per pound more than asked for single thread good, even if it lieve the manufacturer can get the additional cost of the goods. Fillmore

TESTING TEXTILE FABRICS

Editor Textile World Record:

Please give replies to the following questions regarding tests for wool, cotton, silk and linen. What is the method adopted in making the following tests:

1. To find if cotton is mixed with wool.
2. To find if cotton is mixed with silk.
3. To find if ramie is mixed with silk.
4. To determine whether blue on wool is made with indigo.
5. To determine whether blue on wool is dyed with alizarine.
6. To determine aniline blue on wool.
7. To determine logwood blue on wool.
8. To test dark blue on cotton warp goods.
9. To test blue on silk.
10. To test blue on cotton or ramie.
11. To test black for indigo, alizarine, aniline or developed color.
12. To test black on cotton.
13. To test black on cotton and ramie.

Lakewood (1279).

"Lakewood" asks for a number of tests applicable to fibers and fabrics, and to identify certain coloring matters on the same. In an article printed in another part of this issue these tests are given in detail. In the so-called "spot test"we draw attention to the fact that this method of "testing" is antiquated, fallacious and entirely unworthy of serious consideration. No person at all familiar with colors and fabrics as dyed today will pay any attention to its indications. In the old days when indigo was practically the only blue coloring matter employed, the aqua regia test was of value, but since many coloring matters of artificial origin have been brought out which show the yellow spot with nitric acid the value of the test has vanished. Among the well known dyes which respond to this test much after the fashion of indigo may be named the following: Lanafuchsine 6 B, Azo Wool Violet 7 R, Acid Greens of various marks, Formyl Blue B, Formyl Violet S 4 B, Alkaline Violet C A, Anthracene Acid Blue D, and a few others. Louis J. Matos.

THE NUMBER OF KNITTING MILLS

Editor Textile World Record:

Will you please tell me how many knitting mills there are in the United States and how many of them are located in the Southern States? Also how many are there in Canada?

Winford (1906).

The American Directory of the Knitting Trade for 1911, recently published by the Textile World Record, contains the reports of 1,755 knitting mills in the United States and 108 in Canada. There are 190 knitting mills in the southern states.

It may be of some interest to give the number of knitting mills of each state, arranged in groups.

Southern States.		Pacific States.	
Alabama	6	California	7
Georgia	30	Colorado	1
Kentucky	2	Idaho	1
Louisiana	2	Oregon	3
Mississippi	1	Utah	12
N. Carolina	84	Wash.	6
S. Carolina	12		30
Tennessee	29		
Texas	2	Middle Atlantic States.	
Virginia	19	Delaware	4
W. Virginia	3	Maryland	9
	190	New Jersey	54
Central States.		New York	431
Illinois	51	Pennsylvania	583
Indiana	14		1,081
Iowa	6	New England States.	
Michigan	45	Connecticut	27
Minnesota	20	Maine	6
Missouri	6	Mass.	100
Nebraska	1	N. H.	26
Ohio	55	R. I.	23
Oklahoma	2	Vermont	11
Wisconsin	61		193
	251		

Total in United States	1,755
Canada	108
	1,863

SIZE OF SILK

Editor Textile World Record:

Will you tell me how to find the size in deniers of silk knowing the weight say of 120 yards? Is there a difference in the yards per pound of a certain denier silk in this country and in France?

Denier (1287).

There is a slight variation in the Lyons, Milan and Turin standards for the denier count, but this variation is so small, the extreme being only 1 per cent., that it can be safely ignored. The Lyons denier count is equal to the number of grains in the weight of 634 1/2 yards, and is the basis for our calculations. As a result the ratio between the denier count and the grains per 120 yards is (634 1/2 ÷ 120) 5.288.

Ex. What is the denier count of yarn weighing 13 grains per 120 yards?

$13 \times 5.288 = 68.7$ denier.

REAL ANGORA YARN

Editor Textile World Record:

Can you supply us with the address in France of a mill that can manufacture real angora yarns, and that can spin the correct sizes for work on knitting machines?

Angora (1910).

Our French correspondent replies as follows:

Real angora yarn is used in the manufacture of sporting goods, woven or knit, and is made from the hair of the angora rabbit. The hair, which is taken from the animal three times a year, is used without mixing with other material and is spun by hand or power. The system of power spinning was patented by M. Reverend du Mesnil, French patent No. 385,767, Dec. 30, 1907. The hair is oiled with 5 per cent. of mineral oil and then carded. After coming from the card the roving is spun into yarn on a self acting mule by the ordinary carded woolen system. The yarn thus produced is either woven or knit into fabrics. The cloth is washed in hot water, 76° F., containing a small quantity of Marseilles soap and 1 per cent. of alkali. The French manufacturer of angora yarn is M. Reverend du Mesnil, Charlieu, Loire, France. I enclose his letter, price list and a sample of goods made from his yarn. The fabrics made from angora yarn possess all the electrical properties of the hair of the ordinary cat. Moreover the fabrics are very light, warm, solid and washable. As the angora rabbit hair has no felting qualities the cloth can be washed indefinitely in hot water and soap without danger of shrinkage. It is the softest and warmest of all fabrics and possesses absorbing qualities in a high degree.

Gaul.

Russia ranks third among the cotton-spinning countries of Europe, with 8,076,460 spindles and she has 137,964 power-looms.

Knitting Department

THE KNIT GOODS SITUATION

The warm weather of the past month has had the effect of stimulating knit underwear business in all quarters. We have heard it reported that many retailers state they have had the heaviest May business on light weight underwear in their history and this is, of course, reflected in the demand made upon the jobbers for duplicates, which have been coming to hand by telegraph and mail in goodly number. The heavy business that has been done has shown that what was wanted to stimulate trade was in a large measure warm weather, more than any adjustment of tariff rates or settlement of legislation.

Most mills making light weight goods are running fairly full, but there are quite a number that are not getting out as large a production as in some former years, due to the cool weather that prevailed during April.

The heavy stocks that were in the hands of jobbers a month ago have been cut into considerably and in spots have been practically cleaned up. This is especially true of stocks of men's combination suits on which there has been a tremendous increase of business. These have been gradually growing in favor for the past two or three years, but the extraordinary increase in their use this season was unlooked for. Every manufacturer of men's combination suits is receiving plenty of business and a great many orders for case lots to be shipped by express. The demand for men's suits has not been for the ribbed fabric alone, but there has been a larger call than ever for suits made of nainsook, as well as a liberal call for all kinds of mesh suits, and not a little demand for the flat balbriggan suit.

Many of the better haberdashers are asking for men's suits with drop seats and we learn of some who are quite enthusiastic over the possibility of men's garments made in this way. There are those who predict that when manufacturers succeed in producing lines that are entirely satisfactory, that the shirt drawer business will become a small end of the men's underwear business.

Up to the present time, we have not heard of any quotations on lines for spring, 1912, but have been informed that some manufacturers will be showing their samples by the time this issue is out. It is to be regretted that manufacturers continue to make the mistake of opening their lines so early. Few jobbers are in a position as yet to buy goods intelligently for the coming spring season. Nor is there any necessity of haste in the matter. It is only rarely that retailers can be induced to interest themselves before September first in spring goods and if jobbers place their orders in the month of July, so that samples can be made up and delivered in the month of August, it seems as if July is plenty early enough.

Among the new lines being brought out for spring, 1912, is another of the "Bodyguard" series introduced by the Unica Knitting Co. This fabric has been named the "Airyknit" and is a fine elastic ribbed mesh. Among the claims made for it, are its great durability, being made of hard twisted yarn, and on account of its fineness, it is claimed to have all the necessary qualities to make it a soft, comfortable fabric.

Fall business has been very slow during the past month. Manufacturers have not been receiving any duplicate orders, and the orders that retailers have given to jobbers have amounted to very little. It is perhaps due to some extent to the present agitation of the change of tariff on wool that no orders for wool goods have been placed for some weeks. The few orders that have come to hand recently have been principally for the lower end of cotton goods.

Prices for six pound carded yarn vests and pants remain the same as for several weeks, notwithstanding the steadily advancing market on raw cotton. This is perhaps due to the fact that the call for this grade of merchandise has decreased considerably of late

and those manufacturers who are still in the market are content to take the business with very little profit. The consumers are evidently convinced that better value may be had in vests and pants to retail at 39 to 50 cents. The demand for this class of goods has increased accordingly.

There has been a revival of business in ladies' two by two ribbed fabrics. It is understood that orders have been placed quite freely on lines of ladies' vests and pants made of merino and wool yarns in the coarser ribs in straight vests and with the pants made with tape at the top, rather than with the bands.

HOSIERY

Business on hosiery has not assumed any great volume at any time since the season opened. A great many orders have come forward each week, but the quantities called for have been small as compared with former seasons.

Most manufacturers are in need of business to keep their plants going. Stocks are being accumulated in some instances, and as a result some prices have been reduced since the opening. Perhaps the most noticeable example of the effect of this accumulation of stock is on the 200 needle half hose end. This class of goods was formerly sold at $1.02 1/2 to $1.05 and now in the face of advancing prices for raw material, they are being sold as low as 95 cents. This price cutting is not confined to this one line of half hose by any means, but is evident in other classes of goods and particularly in the ladies' better goods.

There are many jobs and stock lots of ladies' silk hose in the market in qualities at $7.25 to $7.50 that have been subject to gradual reductions, until now the same may be had at $6.50 to $6.75. Other silk lines that sold a few months ago at $12.00 to $12.50, may now be picked up at $10.00 to $10.50. This indicates to us that there were too many of the higher priced lines of silk goods made, more than the country could consume, and that the larger end of the business will get back to the more popular price of 50 cents. Lines that get to the trade for this price continue to be very strong, and some exceedingly good values are now being offered to fill this want.

One maker recently brought out a fashioned pure silk stocking with 10-inch lisle garter top and 4-inch welt at $3.75 which is sure to be a good selling number. Another manufacturer has just introduced a pure silk fashioned half hose, 24 needle, at $3.50 which looks to be exceptional value.

Last season there were a great many infants' silk stockings sold at $1.90 per dozen. These were made in the flat fabric, but this line has now been superceded by a line of very handsome ribbed silk goods in black and colors which get to the retailer for 25 cents.

One new stocking that has made its appearance of late and that is selling well is made with mercerized silk top with long silk boot, heavily embroidered well down to the toe. These are being sold at $6.50 to $6.75 per dozen.

As for colored hosiery, just at present it does not occupy a strong position. While there is at all times a fair demand for pink, blue, lavendar, grey and nile, there are a number of shades that have been good that are now decidedly off, such shades as, peacock, amethyst, wistaria, apricot and all dark green shades.

Since our last issue, tan hose have been in good demand. The advent of warm weather caused the consumers to call for tan very freely, but just at present, this is giving way to some extent to white.

Prices for 1912 now engage the attention of manufacturers and selling agents and from the talk heard round the market, it is thought that prices will be named about the same as now asked for staple lines. With the increased cost of production and higher priced raw materials, manufacturers are justified in asking higher prices for their merchandise, but the lack of activity in the market will probably have the effect of causing the manufacturers to solicit business at old prices.

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In 1908 Italy imported 911,573 bales of cotton and exported 46,164 bales, while the value of the imports of cotton goods amounted to $7,615,558.

ESTIMATING THE COST OF KNIT GOODS

BY NOEL HOWE

The exact calculation of the cost of knit goods is a difficult matter, for the reason that nearly every mill makes several different qualities of goods. To arrive at the exact cost of any one of them is almost an impossible task, as so many different causes operate to make the cost either more or less. One of these factors is production, which enters largely into the estimate of the actual cost of goods.

We will suppose a mill has a capacity of 200 dozen per day, and that the daily expenses for superintending, office help, engineer, watchman, insurance, etc., is $30 per day. This would make the cost for these fixed expenses, 15 cents per dozen, but if the mill from one cause or another should produce only 100 dozen per day, then this cost per dozen would be 30 cents. If the line of goods on which the mill is running does not show a margin of 30 cents per dozen over and above all other costs and expenses, then the mill would be running at a daily loss instead of a profit. Thus production is the important factor in the success or the failure of a mill.

In order to make a safe estimate of cost report production should be obtained from each department. These reports are entered in a book especially printed to suit the requirements of the mill.

The total production is thus found every four weeks or every month, and then the amount paid out for wages in each department is put down recorded. From these two items can be figured the cost per pound or per dozen for each process of manufacturing, by dividing the total cost by the total production.

To be more exact, and to arrive at a closer estimate, these monthly estimates can be tabulated every six or twelve months, and the average cost per pound ascertained, and compared with the monthly tabulations of cost. The cost will undoubtedly vary every month, and also every six months, but this is the only way in which a safe calculaton of cost can be reached.

A method of determinng the cost of any particular line or style of goods in a mill making its own yarn is to have a batch started at the picker room, and a careful record kept of the weight of all raw stock put into it. It is then followed through the card room, keeping track of the waste and card cleanings that are carried back. The roving is weighed as it comes from the finisher and deivered to the spinning room, the spinner keeping track of how many pounds of yarn spun out of the roving, together with the waste in spinning, and the amount of waste left on the spools of roving at the end of the batch. The knitter keeps track of the number of pounds of cloth knit from this lot of yarn, together with the waste from winding, and the yarn waste in knitting. Then the amount of cloth taken to the cutter is noted and a record kept of the quantity of shirts and drawers cut out of the whole lot of cloth knit, the waste carefully being weighed from the cutting.

By this method the mill manager determines how much waste goes back in carding, how much is made in spinning, how much is made in winding and knitting, and how much is made in cutting the cloth into shirts and drawers. Dividing the weight of stock in the batch by the number of dozen of shirts and drawers cut gives the number of pounds of raw stock required for a dozen garments, providing, of course, that the batch through all the processes has been run with the least possible waste, giving credit at the same time for the value of all the waste carried back from all the departments.

This method enables a manufacturer to calculate the cost of raw material per dozen for any line or style. To this has to be added the average labor cost of each department per pound or per dozen, and the average cost for fixed expenses based on the average production per day. The goods from one batch could also be followed through the finishing room and a record kept of the amount of the material used in finishing the lot, thus ascertaining the cost of the material in finishing any one style.

In this way the cost of goods coming through the mill from the raw stock can be

ascertained very closely. The cost depends, however, on the production. This is where the difficulty comes in, as the production varies considerably from month to month.

A main belt may break, something may go

April 10. 1903

Picking Room

Batches		Shoddy	Picker
	lbs	lbs	
Wool	942	125	
Cotton	320	150	
Shoddy	425		
Waste	280		
Totals	1967	275	

George Roberts Foreman

FIG. 1. PICKING ROOM REPORT.

wrong with the engine, and numerous things may happen that will lessen the producton, so that the ony safe way is to keep a daily record of the production of each department, and take an average every month, and again every six and twelve months, basing the estimate on these averages.

Let us suppose that the average production has been 700 dozen per day, that the calculations of cost have been on that average, and that the selling price has been fixed accordingly. If the production should drop to 600 dozen per day, the mill would be running at a daily loss. Certain fixed expenses are not reduced when the production has dropped, nor increased when the full quantity is made.

Starting at the picker room each batch of stock is weighed, and a record kept. In mills where rags are picked into shoddy, a daily record is kept of the number of pounds picked, and from this the cost per pound for picking is determined.

The quantity of stock picked can be taken as the amount carded, as it is difficult to keep a record of the number of pounds run through the cards.

Where the spinners are paid by the piece a record has to be kept of the number of pounds each spinner takes off his mule which makes it easy to obtain a record of the number of pounds spun each day. In the knitting room the winders are generally on piece work and a record is kept of the number of pounds each girl winds; this record also serves for the cost statement.

A printed slip should also be provded for the knitting department, and the number of

April 10 1903

Spinning Room

Name	Mule No	Fine lbs	Med lbs	Coarse lbs			Total
Geo Brown	1	40	126	20			186
J. Robinson	2		280				280
F. Smith	3	60		230			290
Wm Jones	4		300				300
Chas. Roberts	5			480			480
John Ryan	6	100					100
						Total	1636

John McCarthy Foreman

FIG. 2. SPINNER'S DAILY REPORT.

pounds of cloth of each and every roll recorded. These records give the manufacturer a basis on which to figure his cost and from them he can tell if any department is losing or gaining.

In the cutting room a daily record should

April 10 1903

Knitting Room

Mach No	Size Cyl	Style No	lbs	Mach No	Size Cyl	Style No	lbs
			48				45
			46				42
1	20	436	49	9	18	436	46
			57				52
			55				51
2	18	308	52	10	20	308	
			36				58
			38				62
3	17	200		11	21	200	
			62				66
			60				61
4	20	405	64	12	22	200	
			58				39
							41
5	21	436		13	17	436	37
			35				40
			37				41
6	15	436	32	14	16	308	36
			46				56
			44				53
7	19	308		15	20	200	57
			67				60
			65				54
8	22	308		16	21	308	
Total			951	Total			997

Frank O'Brien Foreman

FIG. 3. A REPORT FOR A KNITTING ROOM.

be kept of each roll cut, the number of dozens cut and the amount of waste from each roll. This will also show whether the knitting is coming good or bad. By following these records every day the superintendent can tell if the work is coming through as it should.

The number of garments cut represents closely the daily poduction of a mill if the cutter keeps all the cloth cut up as fast as it comes from the knitting room. If the amount of goods finished is less than the daily cutting, the finishing room is falling behind.

A book should be printed to correspond with each of the slips of the daily reports.

All reports should be signed by the foreman of each department, thus making him responsible for them, and also bringing the progress of the work directly to his knowledge. If his department is not producing what it should he is made aware of it.

Fig. 1 shows the picking room report.

Fig. 2 shows a spinner's daily report for a six set mill having six mules. This can be used for the spinners' time and for the amount of yarn spun by each man on piece work. It also shows the amount each mule is producing each day, as well as the total number of pounds made, and also covers the different weights of the yarn classified according to the price paid per pound.

Fig. 3 is a report for a knitting room having sixteen machines with cylinders ranging from fifteen to twenty-two inches in diameter, each of which should be numbered.

Ordinary shipping tags, or some printed specially for the purpose, are used, on which are put the date, style number, the number of the machine and the size of the cylinder and weight of goods. The size of the cylinder enables the dryer to know what size spreader to use to dry the cloth to the desired width. Spaces are left for three rolls of cloth to be taken from a machine in one day. This form can be modified to suit the requirements of the mill.

This serves a three-fold purpose: First, it is a daily record of the production in pounds of the whole knitting room, from which the time of the knitters can be copied. Second, it shows from day to day the daily production of each machine. Third, by the use of the corresponding tags, it makes it easy to locate the machine which may be making inferior cloth.

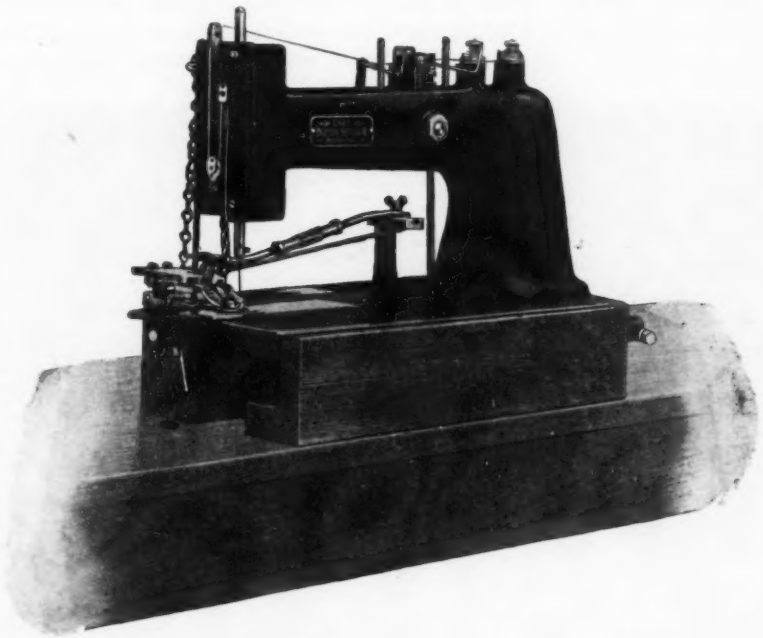
(To be continued.)

Japan supplies nearly one-half the quantity of silk imported into the United States.

ELASTIC STITCH BUTTON SEWING MACHINE

The elastic stitch button sewing machine, built by the Union Button Sewing Co., 184 High St., Boston, has a number of new features which will interest manufacturers of garments, knit underwear, sweater coats, etc.

The use of the elastic stitch in the sewing of buttons allows for the shrinkage of the thread in washing and permits the buttons to be drawn away from the fabric somewhat, making a more easily buttoned garment and furthermore they claim that with the elastic stitch the wear and tear of the laundry is not so great on the buttons.



THE ELASTIC STITCH BUTTON SEWING MACHINE.

This company has developed a button sewing machine which sews the button on to the fabric with a single thread and elastic stitch. This produces the same effect as is found in tailor-made garments where the buttons are sewed by hand with a neck of thread wound between the button and the fabric. With the two thread system, the buttons are pulled down close to the fabric, which makes it more difficult to button the garment without injuring the buttonhole and moreover frequently prevents the garment from laying smooth through lack of sufficient space between the button and button stay to allow for the buttonhole stay. In some cases, when the garment is washed, the thread shrinks and it may break.

There is no under thread used in this machine, which does away with the under shuttle mechanism, simplifying the construction and eliminating the trouble and waste in connection with the winding of bobbins. The thread is severed by a patented thread breaking device instead of by the use of a knife. In this way it is claimed that a much closer finish is obtained. The simplicity of construction enables the machine to be operated at high speed and as there are comparatively few parts, the expense of maintenance is correspondingly reduced.

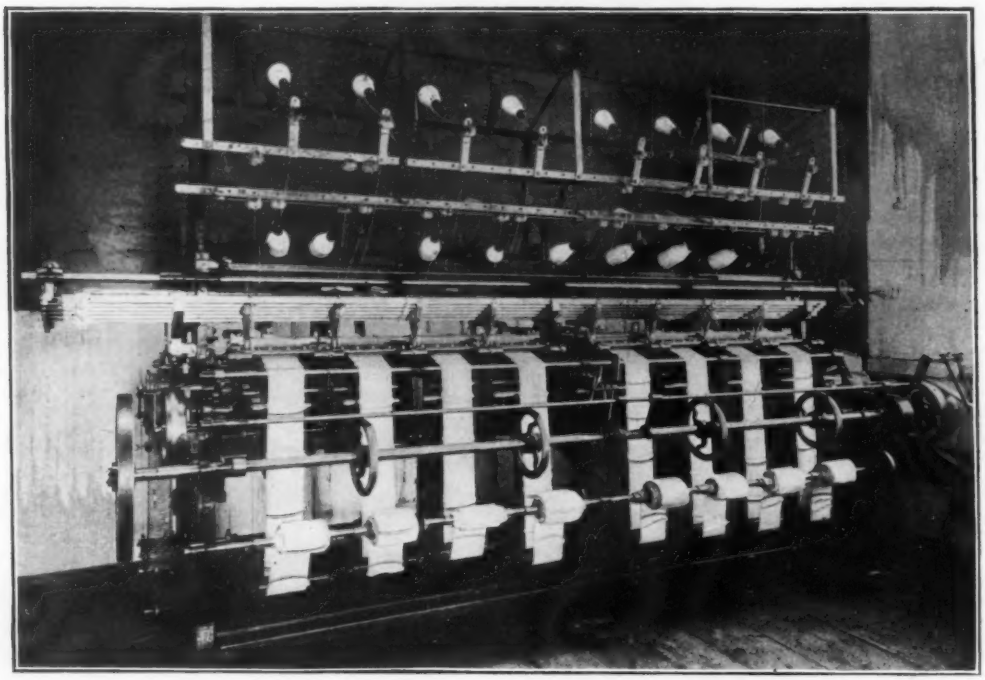
The machine sews on two and four hole button of all sizes and styles. It was exhibited at the exhibition in Philadelphia where

it attracted much interest from manufacturers present.

THE LIEBERKNECHT FLAT RIB FRAME

BY WINWICK

The accompanying illustration shows a new type of flat rib machines built on the improved Cotton system, and for which E. O. Spindler, 350 Broadway, New York, is the sole American agent.



THE LIEBERKNECHT FLAT RIB FRAME.

The machine was invented in France and constructed especially for the knitting of silk. It proved to be so meritorious as regards quantity and excellence of its product, not alone for silk, but for all other kinds of yarn as well, that Lieberknecht of Oberlungwitz, Saxony, purchased all the rights for the manufacture and sale outside of France. At first sight this machine appears like one of the old uprights, although it is not quite as high, but a more careful study will reveal marked changes and improvements. A rib frame of the "Cotton" system is a plain frame of vertical needles with a secondary set of horizontal needles. Both sets work in rotation. The primary or upright set knits the back of the fabric and the welt if it is a pocket welt. The secondary set is finer and, interworking with the first set, knits the face of the goods.

The construction of the Lieberknecht frame is usually rigid, all the joints between the rafters and standards being provided with inserted screws, which maintain the same relative position as when the machine was assembled. Every box and bearing has two steady pins well fitted. All the arms are firmly clamped to the shafting, and the troubles which accompany the taper-pin type of fastening are eliminated. The frame or upright needle plates are at the front, and are easily removed to give the operator a chance to see that the plates are free from lint. Should the needle shank become broken in the tuck-plate, it can be reached and replaced without difficulty.

The machine heads and dividing plates are

individual and may be swung up for examination without disturbing or destroying the work on the other heads. Each machine is also provided with a grooved brass strip, which in conjunction with the presser plates forms a narrow slit, into which the stitches are drawn as they leave the sinkers. After considerable experience with hard lisle yarn, I am led to believe that it is impossible to interlock a stitch on the machine needles. One of the important improvements is the vibratory steel presser. The needles do not go to the press, but as the frame needles are descending in practically a vertical drop, the presser moves out under the sinkers and presses the needle beards. This presser also dips as it comes in contact with the needle beards, and thereby prevents all rake or abrasion of the beards. The same presser plate acts in like manner on the machine needles as soon as the frame needle stitches have settled into place.

The knocking-over bits are at the back of the frame needles, each having a special hook or projection for the turning of the stitches in the pocket-welt. These bits turn the stitches nicely and welts may be made of any desired length. With reasonable care a broken or loosened knocking-over bit is a very rare occurrence. The striking jacks are short and well housed. The sinkers have a drooping nose, thus maintaining the stitch formation to the latest possible instant. This coupled with the straight fall of the frame needles gives unusual uniformity of position of the stitches on the machine needles at the instant of their pressing, regardless of size, quality or kind of yarn used.

Another feature is the regulation of the stitch on the slur bar, as related to the striking jacks. The depth of the run of the stitch cams, commonly called slur cocks, determines the stitch. The stitch for each rib is automatically regulated by swinging arms bearing four stitch screws each. The friction carier box is duplex and the lead of the carriers may be easily regulated as desired.

The slack course and beginning of the welt are controlled by a special pattern wheel, which works in conjunction with the pattern chain. The pattern chain and striping mechanism are operated by two short stroke eccentrics, and they are, therefore, very quiet and smooth in their operation. Each roll of webbing is wound on a simple but ingenious loose sleeve, which interlocks with a screw on the take-up shaft. This rib frame is compact in construction, the cam-motions are well balanced, in fact nearly continuous. On account of the danger of misplacement of stitches being entirely overcome, it is found to be practicable to operate the machine at the high speed of 42 courses per minute in 30 gauge, sections 9 1/2 inches wide.

The machine is ordinarily built with four or six carriers and as the latter place themselves automatically in position between the needles and sinkers the distance of the needles from the sinkers never varies. Ordinarily the machine is built with the following attachments, loose course, draw back, draw thread, separating cuffs without cutting, tuck stitch, plaited tuck stitch. A quite recent patent is the arrangement for eliminating the odd course in making plaited tuck or 1 and 1 striped goods, whereby the production of this class of work is increased fully 33 per cent.

The machine can also be built for working the so-called accordion ribbed hosiery, the instep of the foot being knit direct on the leg, with loose course on the sides for the heels. It can also be arranged for working the heels direct on the legs. The machine can also be built with automatic narrowing and automatic widening, reducing the speed automatically during the narrowing pocess. The machine is built in any number of sections from 4 to 30, and in any gauge up to 36 gauge. The proportion of speed in the different gauges is about as follows:

On sections 9 1/2 inches wide, 30, 27, 24 and 21 gauge is speeded respectively to 42, 45, 48 and 50 courses per minute. This machine can be used for selvage cuffs for underwear, for drawer bottoms, rib tops on hosiery, full fashiond children's hosiery, and full fashioned ribbed underwear, and also accordion silk neckties, being built from 6 to 25 inches per section. Another improve-

ment on the machine is that individual pieces of fabric (not connected with each other) can be made on the machine without causing much delay in production. The machine is also built with Jacquard attachment.

KNITTING MILL NEWS

Canada, British Columbia, Vancouver. A new knitting company known as the Lion Knitting Co., Ltd., has established a plant at 83 Pender St., West, and is making all kinds of sweaters and sweater coats on hand knitting machines. Joseph Lansing is manager. All the equipment proposed has not been installed.

*Canada, Ontario, Woodstock. The Ken Knitting Co., Ltd., reported incorporated a short time ago with capital stock of $100,000 has organized with G. F. Mahon, president, and W. Barrowclough, treasurer. In June construction work will be started on a mill to be equipped for the manufacture of sweater coats, scarfs and fancy knit goods, the machinery to be operated by electric power. The directors expect that manufacturing will begin before the end of October. Details of machinery equipment have not been worked out. Mr. Barrowclough is treasurer of the Oxford Knitting Co. of Woodstock.

Illinois, Chicago. H. M. Kahn, formerly superintendent of the Old Fort Knitting Mills of Fort Wayne, Ind., is starting a mill under the style of the Eagle Hosiery Mills at 1935 West 13th St. Ten seamless hosiery knitting machines will be installed at first for making lisle, mercerized and silk hosiery. L. L. Moore will be superintendent of manufacturing.

Massachusetts, Brookline. A knitting plant has been equipped at 65 Kent St. and is manufacturing jersey cloth, rubber linings and similar goods. The equipment consists of 10 spring needle knitting machines operated by electric power. The product is sold direct. E. L. Barrows is manager and R. J. Logan, treasurer.

*Pennsylvania, Philadelphia. The Henry Lehmuth Company has been granted a charter with capital of $100,000. This concern will manufacture fine full fashioned hosiery, having leased a portion of the new building at Ontario and D Sts., where several sets of full fashion machines will be installed. This machinery is being imported.

South Carolina, Spartanburg. R. T. Jaynes and Wm. A. Hetrick of the Hetrick Hosiery Mills at Walhalla, have purchased a suitable building here for hosiery manufacturing and will organize a company to equip a plant.

Enlargements and Improvements.

*Indiana, Fort Wayne. The capital stock of the Wayne Knitting Mills, Inc., has been increased from $1,000,000 to $1,200,000. As noted last week, a 4-story addition is to be built during the year.

Michigan, Grand Rapids. Thirteen hosiery machines will be purchased by the Grand Rapids Hosiery Co. This is the new concern controlled by the men who control the Globe Knitting Works and which is located in part of the Globe Knitting Works plant.

*Ohio, Cleveland. Work is practically completed on the new mill for the Green-Haas-Schwartz Co., manufacturers of sweater coats, shawls and fancy knit goods. The building consists of 6 floors and basement, containing over 75,000 square feet of space. As noted some time ago, they are to add 20 knitting machines, 30 ribbers and 25 sewing machines. The Green-Haas-Schwartz Co. succeeded the S. Schlesinger Knitting Co. about a year ago. Meyer Jaskulek is president; I. H. Green, treasurer, and J. C. Sampliner, buyer.

New York, New York City. Another loft in the same building has been leased by the New York Knitting Mills, manufacturers of sweater coats and bathing suits, and about 8 new knitting machines will be installed. A. Geiser is superintendent and buyer. Mr. Geiser is interested in information on a napping machine.

New York, Watertown. Late in June or July, the new mill under construction for the Shaughnessy Knitting Co. will be equipped. The building is practically completed. New knitting machines and a new boiler for the dye house have been ordered.

North Carolina, Forest City. C. A. Wilkie, proprietor of the Dixie Knitting Mills Co., contemplates adding new machinery equipment. Two-hundred needle seamless cotton half hose is manufactured on 11 knitting machines, 3 ribbers and 3 loopers.

North Carolina, Plateau. Hosiery knitting machinery is being installed in the Catawba Woolen Mill for making fine woolen hosiery. The P. O. address is Newton, R. F. D. No. 1.

Ohio, Bowling Green. The capacity of the Monarch Underwear Co. will be increased by the addition of several machines.

Pennsylvania, Philadelphia. The Penn Knitting Co., for many years located at Mervine and Montgomery Ave., has removed to the Fretz Bldg., 11th and Diamond Sts., where more room has been secured and other increases made. Women's ribbed underwear in lisle and worsted is manufactured. Harley & Croft are the proprietors.

Pennsylvania, Philadelphia. Weinrach Bros., who are manufacturing polo caps, sacques and bootees by hand at 6109 Ridge Ave., Roxborough, their office and salesrooms being at 56 and 58 N. 3d St., report that they are arranging for the installation during the coming fall of machinery for the manufacture of knit gloves.

Pennsylvania, Philadelphia. The Bridesburg Hosiery Mills Co., at Edgemont and Kirkbride Sts., manufacturers of women's seamless cotton and mercerized hosiery on 20 knitters, report that on or about July 1 they will install 30 new machines,

on which they will manufacture a line of ribbed goods. Their production is sold through J. P. Quinlan, New York.

Pennsylvania, Reading. The Textile Machine Works' new power house is completed and will furnish power for the Berkshire Knitting Mills and the Narrow Fabric Co. in addition to supplying its own plant. The building is 80 by 90 ft. Two stories will be added to the factory building of the Berkshire Knitting Mills.

Pennsylvania, Schuylkill Haven. J. F. Bast, proprietor of the Royal Knitting Mills, will incorporate his business under the style of J. F. Bast & Sons. There is a report that the plant will be enlarged. Women's cotton ribbed vests are manufactured on 46 knitting machines and are bleached and finished.

Pennsylvania, Strausstown. Eight new knitting machines have been installed by Herbein & Anthony and in the near future a further addition of 10 machines will be made. Men's and women's 144-needle half hosiery is manufactured.

*Rhode Island, Woonsocket. Geo. H. Emmott, treasurer of the Rathbun Knitting Co., reports that all contracts for machinery and supplies for the new spinning mill addition have been awarded. The enlargement will be built in about 8 weeks and is to be used for wool carding and spinning.

*Tennessee, Knoxville. Additions to the Standard Knitting Mills outlined several months ago have been completed and equipped and are now in operation. They include a 3-story cotton mill, 75 by 178 ft.; 2-story picker house, 75 by 29 ft.; 2-story warehouse, 30 by 85 ft.; power house, 40 by 70 ft.; bleach and dye house, 50 by 75 ft.; the erection of which cost $52,000. A 3-story and basement building, 48 by 175 ft., was purchased for $22,000 and is used as a knitting mill. The cotton mill manufactures fine yarns for men's union suits made in the old mill. 300,000 dozen men's garments will be made annually. The total equipment now is 18,000 cotton spindles, 100 latch needle knitting machines, 250 sewing machines, steam power equipment and dyeing, bleaching and finishing departments. E. E. McMillan is president; H. B. Branner of the Third National Bank, treasurer, and J. T. Brownlee, secretary, general manager and buyer.

Mills Starting Up.

Pennsylvania, Catawissa. The knitting mill is being started up gradually by the new Catawissa Knitting Co. under the direction of W. H. Laubach, the superintendent and buyer. The plant was formerly operated by the Montour Knitting Co., which went into bankruptcy about a year ago.

*Pennsylvania, Dorrancetown. The Dorrancetown Hosiery Co., previously reported incorporated with capital stock of $20,000, combines the Birth & Weston Knitting Mills and Drake's Knitting Mills, both of which have been closed indefinitely. J. D. Baer is president; Chas. Birth, treasurer, and R. C. Werkheiser, superintendent and buyer. The combined plants have equipment of 31 knitting machines operated on men's and women's hosiery, using 14s to 50s yarns on cones.

Facts and Gossip.

*Canada, Ontario, Hamilton. The report that Penmans, Ltd., will control the reorganized Ellis Co. cannot be confirmed at this time.

Indiana, Richmond. The mill of the Richmond Underwear Co. is completed and 25 knitting machines and a number of sewing machines have been installed. The first floor is used for office purposes and stock room, the second floor for sewing machines and finishing and the third floor for knitting room and cutting.

Louisiana, New Orleans. The National Hosiery Mills have purchased the cotton felt machinery of the Kohlmann Moss & Cotton Felt Mfg. Co. They will manufacture cotton felting and commercial batting in addition to their lines of men's, women's and children's hosiery.

Massachusetts, Lowell. The Middlesex Co. is now manufacturing hosiery and woolen goods and has equipment of 4 60-inch cards, 40 looms and 500 hosiery knitting machines. The capital stock is now $500,000. Paul Butler is president and C. Brooks Stevens, treasurer and agent. Lawrence & Co. sell the hosiery and H. & W. H. Lewis the woolen goods.

Massachusetts, Waltham. The capital stock of the American Knitting Co. has been increased from $10,000 to $25,000.

New Hampshire, Hillsboro. A charter has been granted the Contoocook Mills Corp. under the laws of Massachusetts, with authorized capital stock of $750,000.

New Jersey, Burlington. The plant of John J. McCann, a manufacturer of fleece lined stump stockings for artificial limb wearers, formerly at Washington, Pa., has been removed to 418 York St., Burlington. Mr. McCann operates 4 knitting machines and 1 sewing machine and buys French spun worsted yarns.

New Jersey, Camden. Knitting machines are being installed in a portion of the Highland Mills, at 9th and State Sts., on which a line of Shaker sweaters will be manufactured.

New York, Amsterdam. Stockholders of the Blood Knitting Co. have voted to increase the capital stock from $414,000 to $630,000. In February an increase was made from $18,000 to $414,000.

New York, Brooklyn. The Majestic Knitting Mills have been incorporated with capital stock of $50,000 and succeed the Majestic Knitting Mills, A. Marcus & Co., proprietors. There will be no immediate change in the plant, although an increase is considered for the near future. All kinds of sweaters are manufactured.

New York, Fort Ann. It is reported that the knitting plant of E. Wall, Jr., will not be removed from Fort Ann. Negotiations have been carried on with several other places regarding the removal of the plant.

Dyeing, Bleaching, Finishing, Etc.

DETECTION OF DYED BLACKS UPON COTTON FABRICS

BY DR. LOUIS J. MATOS

The identification of colors upon fabrics is a matter of growing importance, although it is one to which little attention has been given by dyers, and practically no attention on the part of manufacturers who should be familiar with the means to determine with certainty the identity of the character of any particular dyeing.

Blacks, as a rule, are the most frequently tested, as there are several important and distinct means of dyeing them, and for commercial reasons, the identity of any given black dyeing becomes a matter of dollars and cents.

There is no one direct method for testing any black dyeing—no "short cut" to prove its identity—so the dyer must equip himself with the necessary chemicals and a few test-tubes and white china butter dishes so as to be ready at a moment's notice to make a test, which requires but a short time. The necessary chemicals are:

Tin crystal solution. Weak bichromate of potassium (1 per cent. is strong enough). Hydrosulphite of soda solution. Hypochlorite of sodium solution (made from bleaching powder and soda ash). Five per cent. soda ash solution. Dilute sulphuric acid (5 per cent. strength).

Other chemicals, common to every dye house, are also used, but those above mentioned should be kept prepared ready for use. To make a test properly, small clippings of the sample are cut—each need not be more than 1/2 inch square—and also similar clippings of samples of yarn or cloth which have been dyed by each of the several well known dyeing processes, viz: Aniline Black, Sulphur Blacks, Direct Blacks, Developed Direct Blacks, Logwood Blacks, and in making the test a similar portion of each of the other is subjected to the action of the chemicals at the same time, and under the same conditions. The following are the characteristics of the several blacks above named:

Aniline Black. If a dyeing of this black is boiled for a few minutes in a little of the tin crystal solution, the color is changed to a greenish grey or slate color, and if it is then well rinsed with water and the piece then exposed to the air to oxidize, or by immersing the washed clipping in a little weak chrome solution the original black color returns, it is fair to presume the cloth was dyed aniline black. To make a confirmatory test, boil a clipping in the hydrosulphite solution which, if the dyeing is aniline black, it is decolorized, but the original black is restored upon wetting with chrome solution. A further test may be made by warming a clipping with sodium hypochlorite solution, which changes an aniline black dyeing to a brown color.

Sulphur Blacks. All sulphur blacks are completely decolorized by treating with sodium hypochlorite, and the original black does not return when so decolorized. This seems to separate these two blacks. On the other hand sulphur blacks, when boiled with tin crystal solution, are changed to a brown color, which on exposure to the air or spotting with chrome solution changes again to black.

Direct blacks, when boiled for a few minutes in a 5 per cent. soda ash solution, bleed excessively, a quick distinction from all other blacks, but not confirmative. By boiling a clipping with tin crystal solution, the direct blacks are completely decolorized, and as the color cannot be restored by oxidation with chrome or by exposure to air, this test seems to distinguish direct blacks from aniline and sulphur blacks.

Developed Direct Blacks. Boil a small clipping in a test tube with a small quantity

of 5 per cent. soda ash solution and note whether appreciable quantities of black are removed or not, if only traces are removed, then take fresh clippings of the sample to be tested, and clippings of sulphur and aniline black dyeings, and boil each separately with the hydrosulphite solution until decolorization is complete, after which wash each well, and by treatment with weak chrome restore the original black, which will not occur with the sample if it has been dyed with a direct black, and afterwards developed.

The annexed table will give at a glance the general reactions above noted:

Dye	Reagent		
	Fine Crystal Sol.	Sodium Hypochlorite Sol.	Bichromate Sol.
Aniline Black	Greenish grey or slate	Redish black	Black
Sulphur Black	Brownish	Decolorized	Black
Direct Black	Grey or white	Brown to brownish—yellow	Grey or white

Frequently tests are made by placing small clippings of the dyed material in white butter dishes and pouring over them a small quantity of concentrated sulphuric acid, but the results from such a test are not conclusive, and are in many instances frequently misleading on account of the possibility of several colors having been used to build up a shade.

The most satisfactory method for blacks is the one outlined above, and can be used with certainty if the operator will only give it a little study and some time in practice. No published method for textile testing, no matter how perfectly memorized, amounts to anything unless it is subjected to practice, and it is always the lack of familiarity with practical processes that causes many to condemn them. No process for color identification can be perfect, but the one for blacks given above is in daily use, gives good results, and will be continued in use until a better one is worked out.

THE VALUATION OF DYERS' MATERIALS

BY J. DOBROYD

From the Dyer and Calico Printer

(Continued from May)

Matching the shades exactly requires an eye trained to appreciating small differences, and this is also rendered more difficult when the tones vary; for example, one red may be inclined to a blue shade while another verges more on the orange. Blues, also, are different by inclining to the green or purple shade; but, probably, the most difficult colors of all are the yellows and oranges. Pale yellows are the worst of all to gauge; and, besides taking the quality of light into consideration, the physical fitness of the chemist plays an important part.

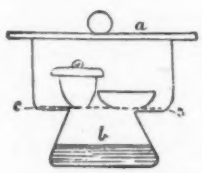


FIG. 4.

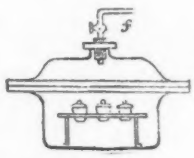


FIG. 5.

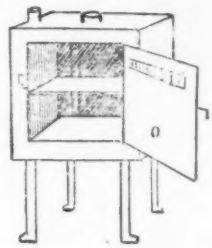


FIG 6.

DYES ON COTTON YARN.

In testing the direct dyes upon cotton rather more yarn should be taken than with wool, certainly not less than 10 grams per sample, while the baths should be worked as described for wool but with an addition of 20 per cent. common salt and 1 per cent. soda ash in place of the Glauber's salt and sulphuric acid. For basic dyes upon cotton all the yarn samples should first be mordanted together in a bath containing 4 per cent. of tannic acid, with only just sufficient water to work the material comfortably, then worked for half an hour at 190° F. and allowed to cool down in the bath for two

hours. Following this the cotton should be lifted and well squeezed, then worked for 15 minutes in a 2 per cent. solution of tartar emetic at the ordinary temperature and well washed in several waters. Basic dyes require 4 per cent. of alum in the bath, which should be started at 100° F. and raised in half an hour to 190° F., at which temperature it should stand for another 30 minutes.

MORDANT DYE TESTS ON WOOL.

When such dyes as alizarine or any other mordant color are to be tested, the yarn should be boiled for one hour in a bath containing 3 per cent. of potassium bichromate and 4 per cent. of tartar, then well washed before dyeing. It is advisable to mordant all the samples in one lot so that the conditions

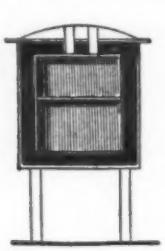


FIG. 7.

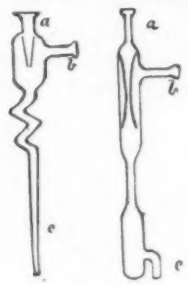


FIG. 8.

and percentages are identical. Moreover, a quantity of yarn, either cotton or wool, may be mordanted and kept for future tests, providing it is well washed, dried, and kept away from moisture and light.

MOISTURE ESTIMATION.

This is a general test applied to many bodies, including silk, wool, cotton and other fibers, in the raw, spun and woven state, besides dyewares and drugs of all descriptions. For all these the same system applies, namely, driving off the moisture by heat, cooling in a dry atmosphere and weighing for loss. Fig. 6 is the usual type of water oven used for small articles; this is made of copper or sheet-iron with an outer jacket containing water, so that the heat never exceeds the boiling point. In driving off moisture from any substance the elimination becomes slower the nearer absolute dryness is reached, and the final traces of water require heat above that which the water bath can give. To obtain this a plain oven without a water jacket is used, although modern types have an outer space which is packed with asbestos to retain the heat, Fig. 7. Figs. 4 and 5 are two types of glass desiccators, the first having concentrated sulphuric acid for a water absorbent in the base B, while the crucibles or whatever article is cooling rests upon a perforated zinc place, C. A is a ground glass cover, which, when slightly smeared with vaseline, forms an air-tight covering with the rim. Fig. 5 is on the same lines, but is fitted with a stop cock and tube at F to enable the interior to be exhausted by connection with an air pump. The two figures at Fig. 8 are glass aspirators by which a partial vacuum may be obtained. A is connected by a rubber tube to a water tap and B to exhaust, the water after doing its work escaping at C.

TESTING THE ACTION OF LIGHT UPON DYED SHADES

BY KURT GEBHARD

From the Journal of the Society of Dyers and Colorists

(Continued from May.)

The effect upon dyestuffs of rays of different wave lengths indicates the source of light to be employed in any standard method of testing. As there is no individual source of artificial light which can approximate to the sun in the intensity of the rays in the invisible as well as in the visible portions of the spectrum, it will be necessary to combine two sources, from one of which the rays of longer wave length may be obtained, the other supplying the rays of shorter wave length. The duration of the exposure to each source of light necessary to obtain the greatest fading effect must be experimentally determined, and, as "normal exposure," be made the basis of all comparative tests.

The initial cost of any such arrangement, as also the cost of working it, would need to be moderate, and it would be necessary to ensure an unvarying intensity of the light, as the rate of fading is not directly proportional to the intensity. So far as can be seen the arc and mercury vapor lamps are suitable.

As an arc lamp the "Regina" may be recommended, but with the mercury vapor lamp the glass tends to become brown, although this fault may be obviated by using the mercury-quartz lamp. The "Uviol" lamp is very good, as it gives a good light and is economical, besides which it does not emit much heat. With combinations where much heat is evolved, the warming effect must be counteracted by suitable cooling arrangements; in all cases it is important that the light rays impinge as nearly as possible at a right angle upon the pattern.

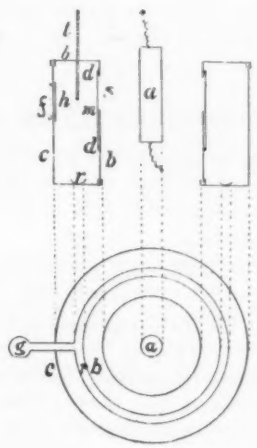
It is well known that the fastness to light of a dyestuff often varies with the fiber upon which it is dyed, or the mordant with which it is combined. Further, as already pointed out, the presence of other substances influences the degree of permanence, so that unless these factors are taken into account the conclusions drawn from any exposure to light may be quite illusory.

As regards the fiber, the influence which this has upon the fastness of the dyestuff to light may depend principally upon the following points: First, the moisture content of the air-dried fiber, i. e., the property of retaining or taking up moisture which, as has been seen, exerts a great influence upon the rate of fading. Secondly, the behavior of the fiber towards oxygen. The different fibers behave differently towards the various combinations of oxygen; thus, cotton shows a greater affinity for ^{+}OH ions, whereas wool and silk readily absorb perhydroxyl ions. The latter fibers thus prevent a portion of the perhydroxyl ions from acting upon the dyestuff, and the fastness of the latter is apparently thus increased. By the oxidation of the fiber also products may result which act favorably with respect to the permanence of the shades. In this connection attention may be drawn to the observation of Schulz, that by the action of hydrogen peroxide upon egg albumen, an oxy-protein is formed, which in comparison with the original substance possesses a distinctly acid character.

The fiber may tend to reduce the dyestuff peroxide, and form some combination with the reduced product. As above mentioned, cotton reacts most readily with ^{+}OH ions; but removal of these results in an increase in the concentration of the perhydroxyl ions, the presence of which so materially accelerates the rate of fading of the color. That ^{+}OH ions are absorbed by cotton is shown to be correct by the observation of Larguier des Bancels, that cotton becomes negatively charged by immersion in water. The negative charge is increased in basic solutions and is diminished by the presence of acid, the tendency to absorption of ^{+}OH ions being correspondingly affected, as also the rate at which fading of the shade proceeds.

The relationship existing between dyestuff

FIG. 1.



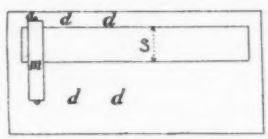


FIG. 2

and fiber has often been noticed, and is the subject of a patent by Meister, Lucius & Bruening, referring to dithioalkyl thio-indigo dyestuffs. The strength of the fiber dyed with these dyestuffs was greatly affected by exposure to light, but the patentees found that an after-treatment of the dyed shade with copper sulphate not only prevented the tendering, but increased the fastness to light. It will always be in place, therefore, to

protect both the fiber and the dyestuff from the effects of the presence of perhydroxyl ions by the use of some compound which will tend to interfere with any reaction between the perhydroxyl ions and the fiber. It need hardly be pointed out, however, that as regards the fastness of the dyestuff, and the strength of the fiber, either of these may easily be preserved if no account be taken of the effect of the treatment upon the other.

The preparation given to the fiber before dyeing plays a part in the question of fastness of the shade, for raw cotton, merely boiled out in water, may be dyed in faster shades than cotton which has been boiled out with alkali; this may be due to traces of substances left in the fiber affecting the autoxidation process.

(To be continued.)

COST OF SIZING MATERIALS

Many long and intricate processes are required to convert raw cotton into finished cloth, and the marvel is that there is so little waste of material.

Textile machinery, however, has reached such a degree of excellence that wastage is reduced to a minimum. In bulk a good deal of cloth is, nevertheless, annually rejected as unfit for export, because of faults that might have been avoided, and these invariably arise in the chemical processes to which the yarn is treated. Spoiled cloth has always to be sold at a considerable loss, and someone has to bear the blame. The manufacturer assures the merchant that he sent the goods to the finisher in good condition, and the finisher or bleacher is equally certain that the goods were spoilt before they reached him.

Has not the time arrived when merchants, printers, bleachers, and finishers and manufacturers should put their heads together to avoid this friction and these frequent losses of trade?

The merchant knows the kind of goods he requires for a particular market, and the bleacher and finisher knows how to meet those requirements when he is not confronted with insurmountable difficulties. During the past year there has been more trouble with rejected goods than before, mainly in consequence of a growing practice of warp sizes being used which contain paraffin wax instead of pure tallow. Paraffin wax offers a remarkable resistance to all known bleaching processes. A leading Manchester bleacher made the following statement regarding this question:

"It absolutely destroys the goods beyond the possibility of successful bleaching. It not only causes an enormous extra cost in dealing with the cloth, but it renders it impossible to finish the cloth in the same way as if the yarn had been tape-sized with pure tallow, or some other substance that does equally well, but can be obtained at a lower cost."

The reason why paraffin wax is being more extensively used is the high price of tallow, which was formerly sold at 25s. to 30s. per cwt., but now costs 40s. per cwt. "There is thus a great temptation," said a textile chemist to our representative, "to offer a tallow at 30s. We find on analysis that these sizing tallows contain anything from 25 to 30 per cent. of unsaponifiable (non-soap-making) waxy matters. Tallow at 30s. per cwt. looks just the same as that at 40s., but we have had samples which contained as high as 50 per cent. of deleterious matter. It would be impossible to get this out in the bleaching, and the effect would be that the cloth would be so limp that it would have to be rejected."

Most manufacturers entrust the mixing of their size to the taper, and tapers are an exclusive class of operatives who invariably have their own recipes, which are preserved as though they were profound secrets. Sometimes the ingredients may be all that are required for easy weaving, which is the main object of tape-sizing, but simply disastrous to the cloth when it comes to be finished. "I do not believe that the tape-sizers realize this," the chemist said, "and many of the faults are the result of ignorance of the requirements of the finisher."

The cost of tallow really makes very little difference to the cost of the cloth. On the average not more than 31 lbs. of tallow are used in a hundredweight of cloth. Sometimes, however, paraffin wax is used by a

weaver, who places a piece at each side of the warp to make the yarn weave better. The result in the bleaching and finishing is a limpness for a few inches at each side of the piece. Paraffin wax is being banned on the Continent, and such a recognized authority as M. Scheurer has reported that he considers paraffin is the product which exercises the most powerful authority during the impregnation of cotton with liquids.

Another of the bleacher's complaints against the warp-sizer is the use of various quantities of magnesium and zinc chlorides. These are employed to attract the humidity in the atmosphere of the weaving shed, and to keep the cloth in a friable condition. "They are used in such quantities," said the chemist, "that when we come to singe the goods before bleaching we find that the warp threads are damaged, and the cloth is what we call tender. The amount of zinc chloride and magnesium that will do the damage is very small. Half a per cent. of zinc chloride or magnesium is sufficient to run the risk of damage when the goods are well singed. It might be admissible to use these chemicals for cloth in the grey state, but where goods have to be bleached there are other sizes which answer equally well. It only requires manufacturers and bleachers to put their heads together to find a satisfactory substitute.

"We have another complaint against the sizers, apart from paraffin wax," continued the expert chemist, "and that is heavy sizing. When we bleach we have to take all the size out that the manufacturer puts in, and it appears to me a foolish policy for them to put in anything above the 10 per cent. of size required for weaving. We can put in any weight that the merchant requires. A conference between the people concerned would clear the air and make things easier for everybody. The point of view of the bleacher is not always the tape-sizer's point of view, and we could, I think, devise some means of smoothing our difficulties. I know there are difficulties in the way. The merchant will not say where he gets his grey cloth, the agent will not disclose who his manufacturer is, and generally the manufacturer does not know the destination of his goods. If the Calico Printers, the Bleachers' Association, and the Bradford Dyers could have a conference with the makers of the goods, I believe we could devise a method of sizing cotton which would simplify bleaching and finishing very much.

"Bleaching is easier than it was 25 years ago, and the matter only wants bringing home to the people concerned to make it easier still. The less friction there is between the parties concerned the more smoothly trade will go on."—The Manchester (Eng.) Chronicle.

Dye Recipes

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation. Subscription price for the Dyers' Supplement $1.00 per year.

Recipe No. 81

BLACK ON COTTON YARN

Sulphur Black S X on 100 lbs. cotton yarn. Prepare the dye bath with

7 lbs. Sulphur Black S X.
(Read Holliday & Sons, 11 Gold St., New York.)
7 lbs. Sodium Sulphide Conc.
2 lbs. Soda Ash.
25 lbs. Common Salt.

Enter just below the boil, and dye for 3/4 to 1 hour at a gentle boil. Sulphur Black S X has excellent leveling powers.

Recipe No. 82

YELLOW ON WORSTED YARN

Acid Brilliant Yellow 6659 on 100 lbs. worsted yarn. Prepare the dye bath with

1 lb. Acid Brilliant Yellow 6659.
(Innis Speiden Co., 46 Cliff St., N. Y.)
10 lbs. Glauber's Salt.
3 lbs. Sulphuric Acid.

Enter at 140° F., bring slowly to a boil and dye at a boil for one hour.

Acid Brilliant Yellow 6659 has exceptionally good leveling powers. It is very fast to light, acids and stoving.

Recipe No. 83

GREEN ON COTTON YARN, COMPOUND SHADE

Prepare the dye bath with

6 lbs. Helindone Blue 3 G N.
24 lbs. Helindone Yellow 3 G N.
(H. A. Metz & Co., 122 Hudson St., N. Y.)
14 lbs. Caustic Soda Solution, 40° Be.
10 gals. Water.
10 lbs. Hydrosulphite M L B Powder.

Prepare the dye bath with this stock solution and the necessary amount of water. Dye at a little above 100° F., until the material is thoroughly saturated. Then expose to the air 15 to 20 minutes, and work in a boiling soap bath for 1/2 hour.

This combination produces a particularly bright and fast shade of green.

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Recipe No. 84

RED ON WORSTED YARN

Phenylene Fast Red B on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Phenylene Fast Red B.
(W. F. Sykes & Co., 85 Water St., N. Y.)
4 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter at 160° F., and dye at a boil for one hour. Phenylene Fast Red B is recommended on account of its brilliancy and fastness to light and washing.

—÷—

Recipe No. 85

RED ON COTTON YARN

Direct Red M on 100 lbs. cotton yarn. Prepare the dye bath with

2 lbs. Direct Red M.
(E. M. Thayer & Co., 411 Atlantic Ave., Boston.)
20 lbs. Common Salt.

Enter at 180° F., and dye at a boil for one hour.

Direct Red M possesses the usual properties of the direct cotton colors, and is particularly useful for self shades.

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Recipe No. 86

BLUE ON WORSTED YARN

Neptune Blue B G Extra on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Neptune Blue B G Extra.
(Badische Co., 86 Federal St., Boston.)
15 lbs. Glauber's Salt.
3 lbs. Sulphuric Acid.

Enter at 140° F., bring to a boil and dye at a boil for one hour.

Neptune Blue B G Extra produces very bright and clear shades of blue possessing very good fastness to light. It may be used in combination with other colors.

—÷—

Recipe No. 87

VIOLET ON COTTON YARN

Thion Violet 3 R Pat. on 100 lbs. cotton yarn. Prepare the dye bath with

5 lbs. Thion Violet 3 R Pat.
(Kalle & Co., 530 Canal St., N. Y.)
3 lbs. Sodium Sulphide.
10 lbs. Common Salt.

Dye at a temperature just below the boil for one hour. Thion Violet 3 R Pat. possesses extreme fastness to washing and milling, and good fastness to light.

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Recipe No. 88

BLUE ON WORSTED YARN

Alphanol Blue 5 R N on 100 lbs. worsted yarn. Prepare the dye bath with

4 lbs. Alphanol Blue 5 R N.
(Cassella Color Co., 182 Front St., N. Y.)
20 lbs. Glauber's Salt.
5 lbs. Ammonium Acetate.

Enter at 120° F., and dye at a boil for one hour. Then exhaust the dye bath by adding

3 lbs. Acetic Acid.

Alphanol Blue 5 R N possesses excellent fastness to light, washing and alkalies.

—÷—

Recipe No. 89

BLUE ON WORSTED YARN

Fast Chrome Blue G on 100 lbs. worsted yarn. Prepare the dye bath with

4 lbs. Fast Chrome Blue G.
(C. Bischoff & Co., 451 Washington St., N. Y.)
10 lbs. Glauber's Salt.
2 lbs. Acetic Acid.

Enter at 120° F., raise slowly to a boil and dye at a boil for 1/2 to 3/4 of an hour. Then exhaust by adding

3 lbs. Acetic Acid

and boiling for 1/2 hour longer. Then add

3 lbs. Potassium Bichromate

and continue the boiling for 3/4 of an hour.

Fast Chrome Blue G possesses excellent fastness to light and washing, and will be found an excellent color for general use in wool dyeing.

Recipe No 90

SCARLET ON UNION DRESS GOODS

Tetrazo Scarlet on 100 lbs. union dress goods. Prepare the dye bath with

2 lbs. Tetrazo Scarlet F.
(American Dyewood Co., 84 William St., New York.)
6⅜ oz. Brilliant Red S R.
15 lbs. Common Salt.

Enter at 140° F., raise to a boil in 1/2 hour, boil 20 minutes and rinse.

The above dyeing represents a line of colors especially adapted for producing on union fabrics fashionable shades of extreme fastness to light. Further particulars will be found on their shade card No. 139D, a copy of which will be furnished on application.

Recipe No. 91

PINK ON UNION DRESS GOODS

Fast pink on 100 lbs. union dress goods. Prepare a dye bath containing

⅜ oz. Tetrazo Scarlet F.
(American Dyewood Co., 84 William St., N. Y.)
1⅛ oz. Tetrazo Fast Lilac R.
½ oz. Brilliant Carmine.
15 lbs. Common Salt.

Enter at 140° F., raise to a boil in 1/2 hour, boil 20 minutes and rinse.

The above dyeing represents a line of colors especially adapted for producing on union fabrics fashionable shades of extreme fastness to light.

Recipe No 92

YELLOW ON WORSTED YARN

Hydrazine Yellow L 3 G on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Hydrazine Yellow L 3 G.
(Geisenheimer & Co., 189 Front St , N. Y.)
10 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 140° F., bring slowly to a boil, and dye at a boil for one hour.

Hydrazine Yellow L 3 G is a level dyeing acid color and will be found excellent for the production of compound shades and self colors in wool dyeing.

Recipe No. 93

SCARLET ON WORSTED YARN

Croceine Scarlet L C on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Croceine Scarlet L C.
(Farbenfabriken Co., 117 Hudson St., N. Y.)
15 lbs. Glauber's Salt.
5 lbs. Sulphuric Acid.

Enter at 140° F., and dye at a boil for one hour.

Croceine Scarlet L C possesses good fastness to alkali and carbonizing and will be found an excellent color for the dyeing of flannel and carpet yarns. It may also be used in silk dyeing and wool printing.

Recipe No. 94

YELLOW ON WORSTED YARN

Hydrazine Yellow L E G on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Hydrazine Yellow L E G.
(Geisenheimer & Co., 189 Front St., N. Y.)
10 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 140° F., bring slowly to a boil, and dye at a boil for one hour.

Hydrazine Yellow L E G is a level dyeing acid color and will be found excellent for the production of compound shades and self colors in wool dyeing.

Recipe No. 95

BLUE ON COTTON YARN

Direct Light Blue B on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Direct Light Blue B.
(F. E. Atteaux & Co., 174 Purchase St., Boston.)
30 lbs. Common Salt.

Direct Light Blue B dyes level and possesses the valuable properties of the direct cotton colors.

Recipe No. 96

GARNET ON WORSTED YARN

Chrome Fast Garnet B L on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Chrome Fast Garnet B L.
(Berlin Aniline Works, 213 Water St., N. Y.)
20 lbs. Glauber's Salt.
3 lbs. Acetic Acid.

Enter at 140° F., raise to a boil in 1/2 hour, and boil for 1/2 hour. Exhaust by addition of

1½ lbs. Sulphuric Acid.

When the bath is exhausted add

1½ lbs. Potassium Bichromate

and boil for 1/2 hour longer.

Chrome Fast Garnet B L possesses excellent fastness to light and weather.

New Machinery and Processes

This department is designed to present from month to month a brief mention of new machinery, devices and processes being brought out in this country and abroad, that are of interest to the textile manufacturers. It is not a list of patents but of improvements on the market, the idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.

Whenever possible we endeavor to make a personal investigation of the new machinery and processes described in this department. In the absence of such personal investigation we must necessarily rely upon information obtained from those who control the machines and processes.

We invite machine builders and others to send us such information for this department.

Selvage Motion. Wilhelm Kauebler, Elmshorn, Germany. An improved selvage motion for weaving a selvage so that the edge will be tight after cutting.

Warp Tension. Adolph Saurer, Arbon, Switzerland. A device for equalizing the tension on the warp during the change of the harness from one shed to another.

Ring Spindle. The Spinnerei St. Blasien, Baden, Germany. An improved ring spindle which has been developed in a Swiss mill.

Reclaiming Wool Scouring Liquor. Georges Malard, Tourcoing, France. A process of reclaiming the potash from wool scouring liquor.

Electric Testing Oven. John Nesbitt, Manchester, England. An improved oven for conditioning textiles and other materials. The heat is derived from electricity, the objectionable gas flame being dispensed with.

Drying Skein Yarn. Wilhelm Kutzleb, Lennep, Germany. A drying machine for skein yarn in which the skeins are stretched on rods and mounted on a traveling chain which carries the yarn through the drying chambers.

Jigger. B. Cohnen, Grevenbroich, Germany. A jigger in which the cloth is wound on rollers submerged in the liquor, and which are driven by contact with lower and corrugated wood rollers.

Warping Machine. W. Hurst & Co., Rochdale, England. An improved cross ball warping machine in which the warp is wound in balls to be dyed or bleached.

Hand Threaded Shuttle. John Smith, Bury, England. A shuttle called the "Specro" which is threaded by hand to obviate the objectionable shuttle kissing.

Self Feed. Fielden & Co., Rochdale, England. An improved self feed for feeding raw stock to scouring, drying, picking and similar machines. It is claimed that this feed is adapted for long, short, coarse, wet or dry wools, and will run the stock completely out ready for a batch of another color.

Weighting Fallers. Oscar Schimmel & Co., Chemnitz, Germany, have recently adopted a number of improvements in the method of weighting mule fallers and which are adapted either for the use of weights or air pressure.

Braiding Machine. Carl Tober, Oberschoeneweide, Germany. An improved circular braiding machine which embodies a number of improvements resulting in an improved product and a larger production.

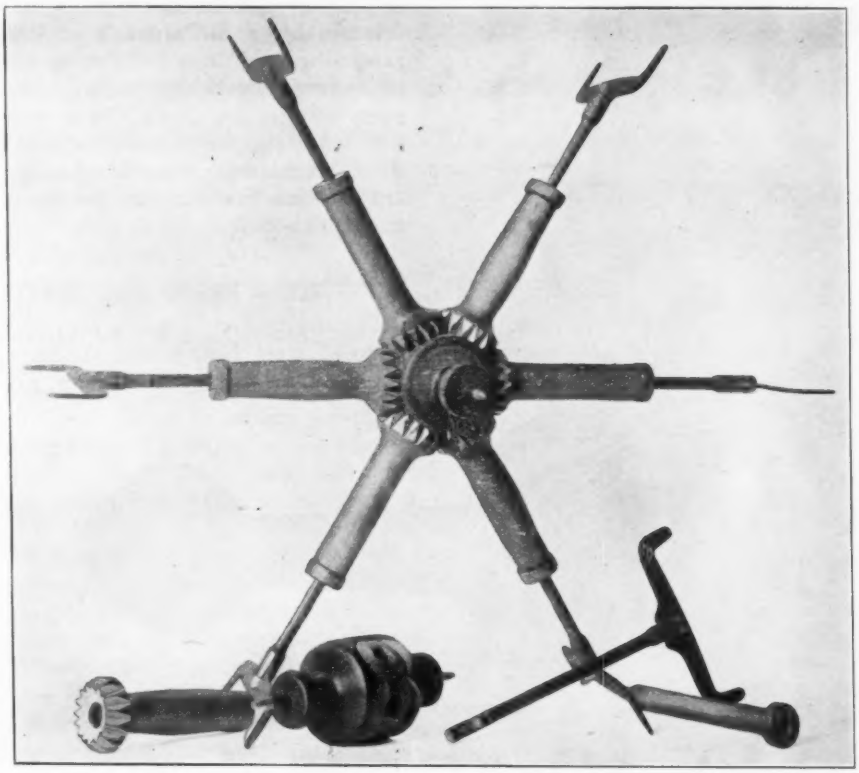
Filling Changing Device. Felix Fernbach, Berlin, Germany. An automatic bobbin changing device for looms which has been developed in a German mill.

Dobby Motion. Gebrueder Staeubli, Horgen, Switzerland. An improved head motion for dobby looms which possesses several improved features.

Card Feed. C. E. Schwalbe, Werdau, Germany. An attachment for first breaker feeds designed to give a more uniform delivery of the material.

THE ATWOOD GEARED SWIFT

In the operation of winding fine threads of silk, cotton or worsted from skeins to spools, it is of the greatest importance that they be wound with uniform tension, and one of the prime factors towards this is a swift that is perfectly balanced and that will hold the skein spread flat. These objects are attained by the use of the Atwood adjustable swift, built by the Atwood Machine Co., Stonington, Conn. The tips or supports for the skein are made from fiber, the upper edge being curved so as to spread the skein and hold it as it was originally wound. This prevents snarls and resulting breakage of the thread. The sticks carrying the tips telescope inside an arm or support and are kept square by a key and spline. Around each support is a gear having a long hub with inside thread that engages the key on the end of the tip stick. When this gear is turned the stick is moved out or in, as desired. The six gears being meshed together, turning any one will expand or contract the supports simultaneously and instantly give the required size to hold the skein tight. All the tips or skein supports, being equidistant from the center, a perfecty balanced swift is obtained, allowing a uniform high speed, with a resulting hard and evenly wound spool.



THE ATWOOD GEARED SWIFT.

The swift is made in two sizes. The smaller ranges from 15 1/2 inches to 22 inches in diameter; the larger, from 18 1/2 inches to 25 inches in diameter. They are fitted with pin gudgeons to run in open bearings, or with a hole through the hub to run on stud bearings, as desired. The material used is thoroughly kiln dried hard maple stock, and the parts are fitted so as to allow for the usual changes in mill temperature. This swift has been used on the Atwood

cotton skein winder, which also has an automatic stop for snarled ends, preventing the breaking of the thread for this cause.

Another of the Atwood specialties is a spooling or doubling frame for the fine

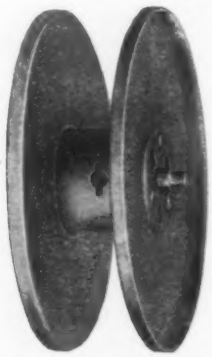


FIG 1. THE MOSSBERG STEEL BEAM FOR NARROW FABRICS.

counts of cotton or worsted yarns. The builders claim that it is the only frame that will successfully and economically double the extremely fine yarns from cops. The automatic stop motion and the tension device in combination with a screw guide motion, give a perfect spool of doubled yarn of two to six ends. These frames have been adopted by some of the largest yarn manufacturers after the most rigid tests, and have been the means of producing a perfect yarn in fine counts, and also greatly reducing the cost of production.

The Atwood products include cotton thread dressers, and automatic thread winders. They also build a full line of silk machinery, being the pioneers and leaders in producing high speed spinning machinery, their products being largely exported to every country engaged in the manufacture of silk. Among the latest machines the Atwood Machine Co. has placed on the market are combination spinning frames and reels for artificial silk.

STEEL BEAMS AND SPOOLS

The illustrations show a few types of the stamped steel beams and spools manufactured by the Frank Mossberg Co., Attleboro, Mass. Fig. 1 is a steel beam for narrow fabrics which possesses many advantages over the ordinary construction, being lighter in weight and practically indestruct-

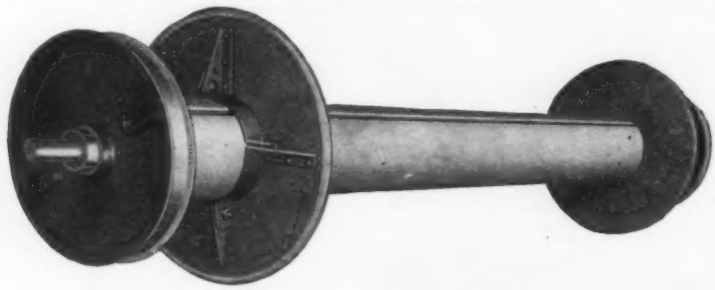


FIG 2. A BEAM FOR BROAD LOOMS.

FIG. 3. A MOSSBERG STAMPED STEEL SPOOL.

ible, effecting an important reduction in the cost of maintenance. The heads and barrels cannot warp or break, however roughly handled, nor do they accumulate dirt or foreign substances. A smooth surface is always presented so that the most delicate warps will not be injured. In the barrel is a special starting slot in which to insert the knotted end of the warp when commencing to wind on the beam. The heads are made with grooved or straight flanges with radial strengthening ribs and suitable means for driving.

Fig. 2 shows a beam for broad looms built with stamped steel heads, and marks an important improvement in beam head construction. It is durable, light in weight, rigid and cannot crack, splinter or warp. The Mossberg broad loom beam heads are made in two types; solid and split in halves. The split beam heads are so constructed that they may be removed without dismounting the beam from the loom. Both types are equipped with a special clamping device for firmly fixing them in position on the beam.

Fig. 3 shows a Mossberg stamped steel spool, being something new in the line of jack and dresser spools. These spools are made with stamped steel heads with radial ribs, firmly bolted to a metal barrel, making a very durable and economical spool.

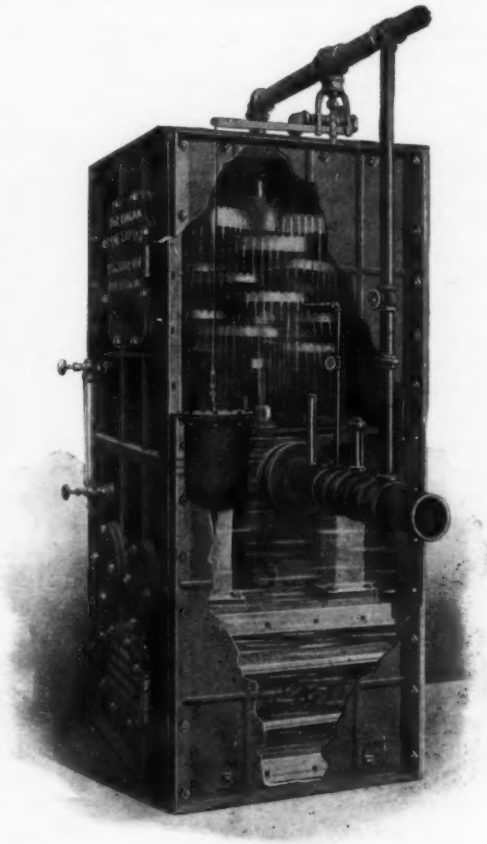
The Frank Mossberg Company are prepared to design and manufacture beams for special requirements. They also manufacture a measuring machine for spinning, twisting, roving, drawing, etc., which registers up to 100 hanks and shows fractional parts of hanks in decimals.

NEW WARP SLASHER

A new warp slasher with a warm air drying arrangement is being introduced in this country by Alfred Suter, textile engineer, of 487 Broadway, New York. The machine is built by Messrs. Suker Bros., Grundberg, Germany, for whom Mr. Suter is the sole American representative. The slasher is designed for cotton, wool and linen warps and several are already in successful operation. In our next issue we shall publish a complete description of this slasher. Any information desired concerning its production, cost, etc., will be furnished by Mr. Suter.

THE ORGAN FEED WATER HEATER AND PURIFIER

Many of the defects in the operation of steam boilers can be traced to defective feed water. All feed water contains a certain amount of impurities; some of these can be precipitated by heating the water to about



THE ORGAN FEED WATER HEATER AND PURIFIER.

200° F. If these substances do not precipitate, they will be deposited as scale, and it has been shown that scale 1/16 inches thick on the boiler heat transmitting surface increases the consumption of coal by 9 per cent. or more. The scale of course deposited becomes a source of danger and interferes with the transmission of heat from which other portions of the sheets or tubes become overheated. These troubles can be eliminated by purifying the water before it enters the boiler. The Organ feed water heater

and purifier, shown in the accompanying illustration, and built by the Exeter Machine Works, Pittston, Pa., has been thoroughly tested under working conditions. It is based on the fact that water can be purified by boiling before it is passed into the boiler. Carbonic acid is expelled which breaks up the bicarbonate held in solution, as a result of the union of carbonic acid with the carbonates of line and magnesia, thereby throwing into suspension or depositing the carbonates of lime and magnesia in the vessel in which it is boiled. This is more easily cleaned and less harmful to the equipment than otherwise.

The Organ heater and purifier is claimed to be one of the most economical methods of purifying feed water. It has ample tray surface for the deposits of the precipitates. This heater not only precipitates the scale forming impurities, but delivers the water to the boilers entirely free from cylinder oil carried in the exhaust steam entering the heater. For every 10° rise in temperature of the water there is a saving of 1 per cent. on the coal pile. This heater delivers water with a temperature within 2° to 5° of the temperature of the steam entering the boiler.

The exhaust steam through the Organ heater strikes first against the plates and then is liberated on the sides which makes only one turn of steam. In the Organ heater the greatest amount of precipitation takes place before the water comes in contact with the filter. The precipitation usually takes place on top of the filter, in which case mud is drawn down a short distance into the filter and afterwards carried into the boiler.

The heater is constructed of cast iron which withstands corrosion and is but little affected by acids. A few of the parts are made of copper or brass. The water supply enters the top of the heater and is conducted downward through a special brass tube which is blanked and flanged at the bottom. At the bottom of the tube a stud is formed which passes through the bottom of the first tray. The tray is held between the flanges and secured by a brass nut, the center of the brass stud is prepared to receive a bolt on which the other trays are suspended in the steam space; a brass nut on the bottom of the bolt holds the trays firmly together, making them perfectly rigid, and prevents them from rattling by the pulsation of the exhaust steam. As shown in the illustration, all the parts are easily accessible in case repairs are needed.

Further information regarding this heater and purifier can be had from the manufacturers.

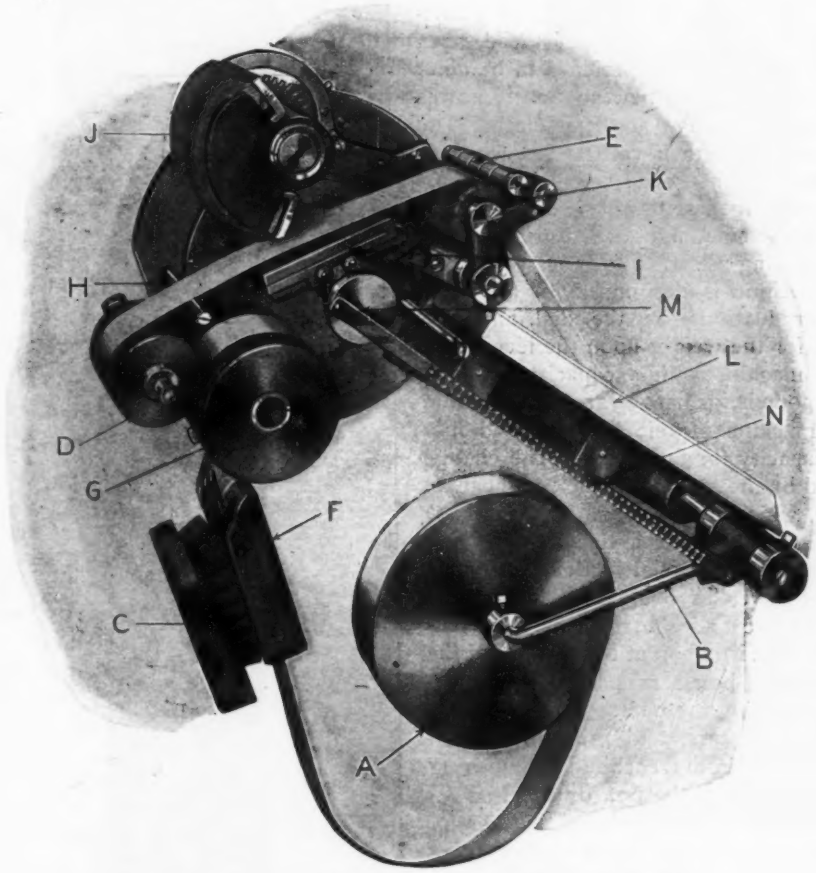
THE PARKS & WOOLSON KAUMAGRAPH TRADE MARKING ATTACHMENT

This attachment, which is manufactured by the Parks & Woolson Machine Co., Springfield, Vt., handles the well known Kaumagraph transfer trademark stamps from a continuous roll of paper tape. The stamps are manufactured by the Kaumagraph Co., 110 West 32nd St., New York, where they can be obtained in any design, color and quantity. They are also supplied by the Parks & Woolson Machine Co.

The attachment transfers or imprints the design continuously on the selvage of any traveling fabric of cotton, wool, silk, linen, elastic, waterproof or other material, whether woven, knit, felted or otherwise made. The impression is durable and will stand severe handling and wrinkling without injury and yet can be readily removed by gasoline. The attachment can be connected with a folding and winding machine so as to apply the trademarks to the selvage at intervals of one, two, three, four, or more yards. Combined in this way with the process of measuring, winding and rolling the goods, the application of the trademarks requires practically no extra labor. If desired the trademark attachment can be mounted on a separate frame, in which case the goods can be taken either from the roll or loose fold and deliver in either condition.

For narow fabrics several of the attachments can be put on one frame, giving a highly productive machine in a small space. The operation of the Parks & Woolson-Kaumagraph attachment, shown in the accompanying illustration is very simple. A small main casting, adapted to the machine handling the web of fabric, contains the running parts necessary to operate a roll of thin

paper tape, an electrically heated flat iron and a rotary asbestos pad. These elements are driven by power from any convenient rotating shaft of the machine by steel chain or gears. The paper tape roll is about 12 inches in diameter and of proper width for the trademark used. At equal intervals on its outer surface the transfer designs are imprinted in a special ink prepared for this process. The paper is intermittently fed in a parallel direction and at an equal speed with the cloth. The cloth travels between the rotating pad above and moving paper beneath and the hot flat iron is timed to rise against the under side of the paper at the proper moment when the design meets the pad, thus instantly transferring the design to the under surface of the cloth without blurring, spreading or other imperfections. The adjustment of the impression can be made with such nicety that it will not strike through the thinnest fabric. Neither will it show through unless the material is transparent.



THE PARKS & WOOLSON KAUMAGRAPH TRADEMARKING ATTACHMENT.

The tape rolls contains from 4,000 to 10,000 stamps according to the size of the design. The cloth may travel at any reasonable speed from 20 to 100 yards per minute. A fresh tape roll can be adjusted into place in one minute. The waste tape drops into a box and is easily removed from time to time or can be carried away by a blower and piping or other means. Very little attention is required and the work can be done by inex-

perienced hands. This attachment is supplied to manufacturers on a long term lease, the rental covering repairs and necessary parts.

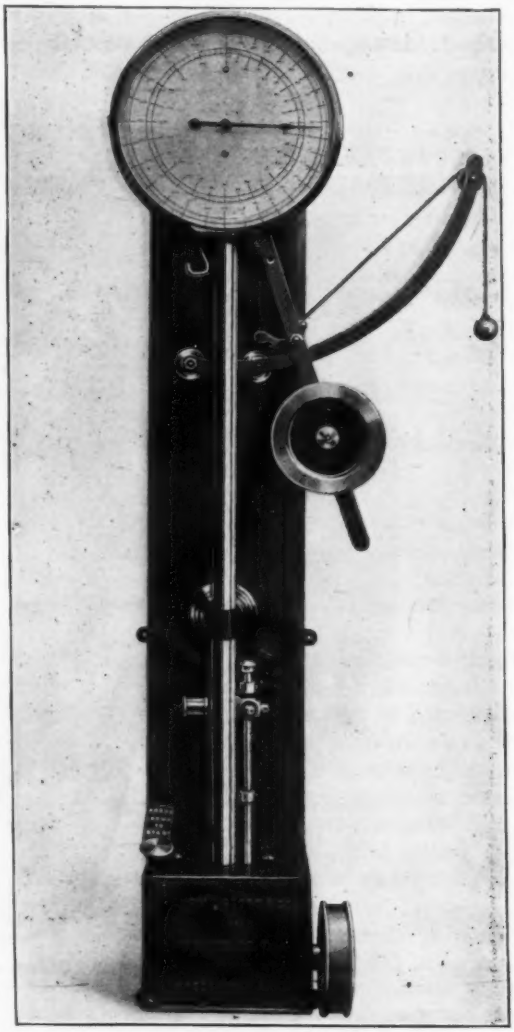
THE SCOTT AUTOMATIC POWER YARN TESTER

Henry L. Scott & Company of Providence, R. I., have recently developed, as a result of many years experience in building testing machines, two new automatic power machines for testing yarn and cloth. The illustration shows their yarn tester, which is constructed on the "dead weight principle," and is so arranged as to give a constant and uniform movement, and eliminates all human agencies during a test.

This machine is designed with a double row of graduations on the dial, and two positions for the weight upon the lever, thus giving a machine with a capacity of three hundred pounds for heavy yarns, and a more delicate machine of one hundred and fifty pounds capacity for fine yarns. The change is affected by the moving of the weight upon the lever, which can be done in a very few seconds. The machine is driven by a one-inch flat belt, requiring less than one-quarter horse power to operate. The moving parts are large and subtantial and are enclosed in a cast iron box at the bottom of the machine. This box serves the double purpose of protecting the operator from getting caught in the gears, and preventing dust, lint, and yarn from reaching the moving parts. The front of the box or cover, is on hinges and may be opened instantly, thereby giving full view of all parts and making them easily accessible.

The stroke of this machine is easily adjusted by two collars on an upright rod. The downward stroke of the nut is so arranged that a speed of twelve inches per minute is steadily maintained, and the return is made at the rate of thirty-six inches per minute. This tester is fitted with a double rack and two pawls, automatically operated on the dead weight principle, and without the use of springs. A novel re-setting device is embodied in this feature, as shown in the illustration.

The test is started after the yarn is in position by pressing upon the lever on the left



THE SCOTT AUTOMATIC POWER YARN TESTER.

hand side of the machine. Should the yarn be twisted, or for any reason the operator wishes to reverse the machine to rearrange the yarn, he can do so by pressing the button on the top of the vertical rod, immediately reversing the machine to its original

position. The downward or working stroke, is carried by a solid steel toothed clutch, making an absolute position movement, while the reverse is operated by a friction clutch giving a speedy and noisless return.

The machine is mounted upon an oak blackboard, provided with malleable iron hangers for supporting it in position on the wall. All iron parts are finished in hard baked black enamel, while the bright work is in nickle. The dial is white enamel with black figures, and is distinctly and easily read. This tester is designed to meet the demand from manufacturers of textile goods for an accurate, simple and substantially constructed yarn tester. The manufacturers of this machine have such faith in their products that they are placing them on thirty days approval, with the privilege of returning the machines at their expense if not thoroughly satisfactory.

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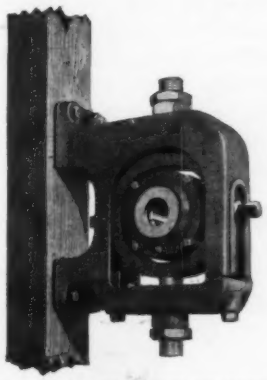
BALL BEARING HANGERS IN TEXTILE MILLS

BY HERBERT L. TOWLE

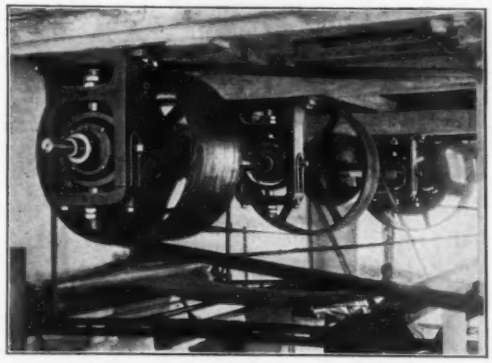
In many textile mills, particularly the long-established mills, power is transmitted through very long lines of shafting by successive belts or by vertical shafts and angle drives from floor to floor. The waste of power in these long transmissions is very great, and, owing to the light character of the work, the percentage of loss is greater than it would be on heavier work. It is a safe statement that one-third of the total investment in power plant of the average textile mill serves no useful purpose. It is spent merely to fritter away power in useless friction, to be followed by further expense for oil, belting and repairs. What this amounts to in mills using from 1,000 to 10,000 h. p. may be easily calculated.

Knowledge of this great waste of power has led to serious study of the best means of reducing the line shaft friction. One expedient is the group system of driving by electrical motors. This is a partial solution but not complete. About as many hangers are necessary with the group system as with the long continuous shaft lines, the main difference being in the size of the shafting. Whether the transmissions be electrical or through the medium of shafting and belts, a great saving can be made by the substitution of ball bearings for the ordinary babbitted or cast iron boxes in the hangers, and the



THE HESS-BRIGHT BALL BEARING POST HANGER.

percentage of saving figured on the first cost of the installation would be roughly the same, whether the shafts are large or small.



THE MAIN DRIVING BELT IN A TEXTILE MILL.

It goes without saying that the ball bearings to be successful in the service must be very different from the cup and cone bearings familiar in bicycles and light machinery. To stand up under heavy industrial work ball bearings must be far more accurately made, of harder and tougher steel, and more carefuly finished, than most persons except ball bearing experts realize. Owing to the hardness and incompressibility of the steel, the balls and races must be sized and finished

with extreme accuracy, otherwise some balls will get no load at all and their neighbors will get too much. Aside from these points, the cup and cone design is in itself objectionable, as it gives the balls a spinning motion and subjects them to loads in excess of the requirements of the work.

On the other hand, ball bearings have certain advantages for line shafting. Commercial shafting is seldom perfectly cylindrical or exact to size, and it is comparatively soft. Again, the hangers are rarely lined up with accuracy. Even if care is used, a change in the loading of the floor above will cause the beams to spring. A ball bearing hanger of the right sort adapts itself to all these conditions. As the hardened races, in which the

A SECTION OF A HESS-BRIGHT BALL BEARING CEILING HANGER.

balls run, are continuous, there is no chance for the balls to destroy themselves by hammering against exposed edges or corners. As a ball does not roll on a fixed axis, it cannot destroy itself and the shaft or sleeve by running askew and grinding.

The accompanying illustrations show a hanger designed by the Hess-Bright Manufacturing Company of Philadelphia, Pa. It contains the well known Hess-Bright annular ball bearings. These bearings, which are manufactured by the company just named and by the Deutsche Waffen-und-munitions Fabriken of Berlin, Germany, were developed by the latter firm as the result of a prolonged and costly series of experiments some ten years ago, to determine the precise requirements making for durability in ball bearings under the maximum loads and highest speeds. These bearings are now used in the heaviest service in automobiles, machine and woodworking tools, electrical machinery, etc.

Examining the hanger itself, we find that it consists of a frame, a yoke which swivels on a vertical axis in the frame, and a housing which contains the bearings. The yoke is hung from the top screw, thereby facilitating accurate alignment and rendering it difficult for the millwright to throw the shaft out of line by a final turn on the set screw, as might happen if the yoke were supported from beneath as is usually done. The horizontal set screws and the yoke itself give the shaft a complete universal swivel without sloppiness, besides an adjustment of one inch in all directions from the central position.

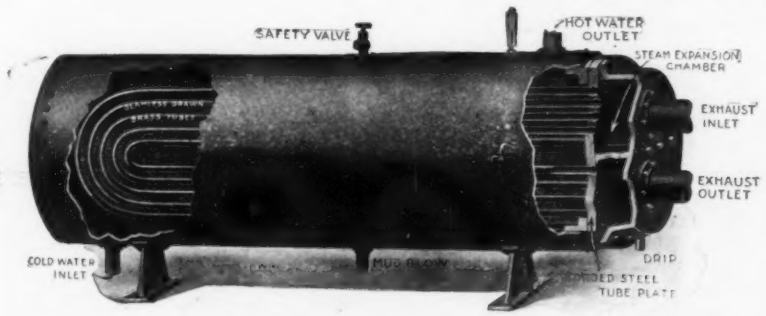
The bearing is mounted on the shaft by means of an "adapter", which consist of a pair of split sleeves with inside and outside tapers. The outer sleeve is a fit in the ball bearing. The inner sleeve is driven tightly home between the outer sleeve and the shaft, and is clamped by the split collar as shown

The durability of any anti-friction bearing depends largely on its being thoroughly lubricated and kept free from water and dirt. Both these ends are attained by the double lipped and grooved closures around the shaft. As the bearing does not wear loose, these closures always fit very close to the shaft, having clearance of not more than 1/64 inch on the diameter. This clearance fills with grease and dust, which forms an effectual seal. This is equally effective in keeping the lubricant in and so promotes cleanliness. One filling of oil or thin grease is found to last six months or a year.

A correctly planned installation of Hess-Bright line shaft hangers will, it is claimed, last almost indefinitely without wear, since the bearings have no friction to cause wear. Bearings of this sort have run on line shafts and in machine tools and other machinery for five years, and on being taken out and measured have shown no more radical freedom between balls and races than would be passed by the manufacturers in a new bearing, i. e. about one-thousandth of an inch in a bearing of average size.

THE UTILIZATION OF WASTE HEAT IN TEXTILE MILLS

In the ordinary mill practice, if the energy of steam has been used in turning over the engine and driving the machines, it is considered that the expense of making the steam has been fully justified. In addition to its energy, however, steam possesses another element fully as valuable, namely, its heat, and this heat is often allowed to go to waste or at the best is used only to a small extent in heating the feed water for the boiler.



THE KELLY SYSTEM OF HOT WATER HEATING.

The heating efficiency of exhaust steam is practically the same as that of live steam, that is, one pound of exhaust steam after leaving the engine will heat about as much water as one pound of live steam taken directly from the boiler. A pound of exhaust steam contains 966 available heat units, or enough in condensing to raise the temperature of over 7 pounds of water from 50° to 180° Fahr. In any place where large quantities of hot water are used every pound of live steam used for heating it while exhaust steam is going to waste, represents just so much money thrown away. What this amounts to is easily determined. Using anthracite coal of average quality, there will be available 8333 heat units for each pound of coal burned, equivalent to approximately 8 1/4 pounds of steam. As one pound of steam will heat seven pounds of water, the heat from one pound of coal will raise the temperature of 59 1/2 pounds of water, or about 7 1/3 gallons, from 50° to 180° F.

To heat one thousand gallons of water therefore from 50° to 180° F., requires all the steam that can be developed from the combustion of 136 pounds of coal, which at $3.00 per ton would cost a little over twenty cents. Heating 1000 gallons per hour with live steam (which is not a large amount of water for a dye house or mill) would cost $2.00 per day of ten hours or $600.00 per year. To do this same work with exhaust steam would cost nothing. In addition to the saving of steam an increased output can also be effected.

Without proper means for the utilization of the exhaust steam and where the steam is introduced directly into the water, the work is held back because after filling the vats and tubs, considerable time is required, varying with the size and shape of the vats, to raise the temperature of the water to the desired initial degree.

This can be overcome by heating the water separately from the vats and tubs, so that when they are to be filled, this can be done instantly, with water at the right temperature to begin operations. Even if it is necessary to use steam afterwards to maintain the temperature, the saving of time and steam in the initial heating of the water has been made.

The Kelley system of hot water heating, shown in the accompanying illustration, is designed to use exhaust steam for heating water for all domestic and manufacturing purposes and the system is adapted to dye houses, laundries, bleacheries, hotels, public baths, and wherever pure hot water is required. The heaters used in this system have ample storage capacity, are instaneous and of different types, being either water

tube, steam tube, storage or the multiple live and exhaust steam heater. Only after a survey of the conditions of each individual plant can the particular type of heater best adapted to the requirements be recommened. These heaters are made in both the horizontal and vertical style and for any capacity. They can also be operated with live steam or with the returns from the heating system. The Kelley system is manufactured by Benj. F. Kelley & Son, 25 Dey St., New York City. They have branch offices in the principal cities and will be glad at any time to have their engineers make an examination of any plant and submit specifications covering the adaption of the Kelley system.

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There are in Russia 20,717 factories, which employ 1,671,088 people, of whom 399,903 are engaged in the textile trades.

FERALUN, A NEW PRODUCT

By H. W. MOWERY, New Dorp, Staten Island, N. Y.

A new product called Feralun is a combination of iron and pure corundum giving a hard wear resisting surface. It was first used about four years ago for liner plates in centrifugal sand dredging pumps. In that service it was found to wear three to five times as long as hard white iron or rolled steel plates. While making these liner plates it was noticed that with slight changes in the method of manufacture a casting with a gritty surface could be produced. Such castings were not desirable for liner plates, but it was thought they would make in suitable form a good anti-slip surface for stair treads and similar purposes.

FIG. 1.

Many accidents are caused by slipping around bleaching and dye tubs because of the soapy water on the floor and around

textile machines because of the grease and oil on the floor. Feralun is the only material which gives a perfectly anti-slip surface. Many claims for injuries caused by slipping can be eliminated by the use of this product.

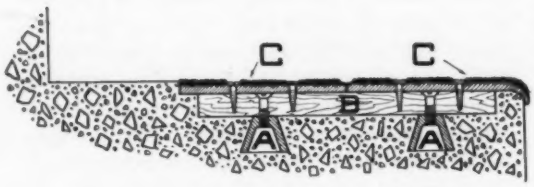


FIG. 2.

All other solid materials used to prevent slipping and resist wear become slippery under some conditions, but the gritty surface of Feralun is not rendered slippery even by soapy water or oil. This is because the sharp grains of the abrasive material grip the leather of the shoes, no matter what fluid may intervene. Plain cast iron steps and metal floor plates at best afford an insecure foothold, but when covered with oil or soapy water they are decidedly dangerous. Wood and concrete also are unsatisfactory. Besides requiring frequent renewals or repairs they absorb oil, hold dirt, are unsanitary and also get very slippery. These disadvantages are overcome by the use of Feralun, which wears four times as long as chilled iron. It soon pays for itself by the actual saving in maintenance costs without taking into consideration the elimination of many accident claims.

The first installation of Feralun as a Safety Tread was in February, 1909, in a prominent railroad terminal at Jersey City. A large number of installations have been made in many different classes of buildings since that time. One that will be of particular interest to textile manufacturers is shown at Fig. 1, showing factory stairs with Feralun safety treads on worn wood steps. The old wood treads were badly worn or cupped out. A plate of Feralun 1/4 inch thick and seven inches wide extending to

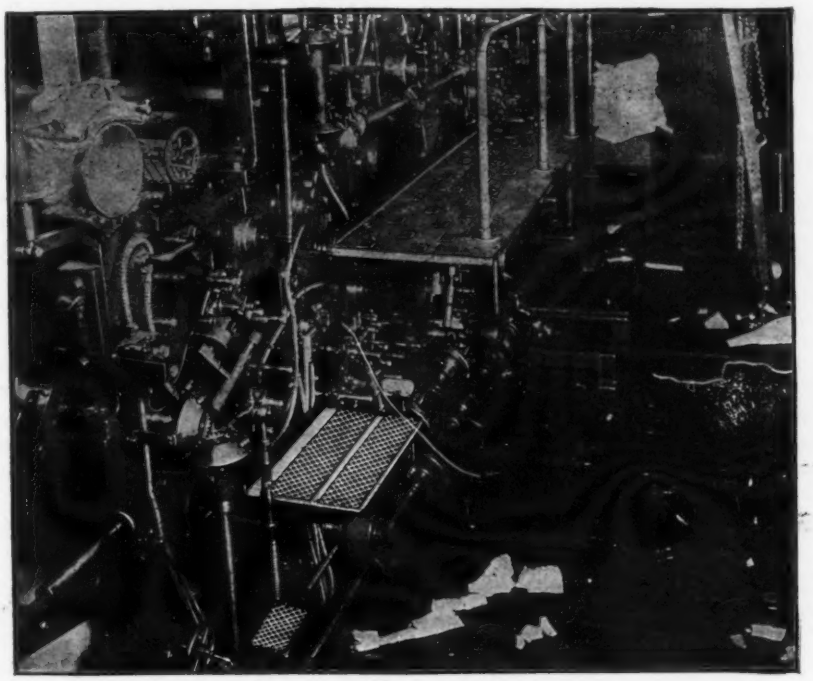


FIG. 3.

within four inches of the strings was applied with No. 10 wood screws. A 3/4 inch lip covers the worn edges of the old wood treads beneath, making the Feralun tread rigid and continuing the anti-slip surface over the nosing. Particular attention is called to this feature. One almost invariably treads on the edge of the step when descending stairs and a slip here usually proves serious. Feralun treads alone have the anti-slip element in the nosing, and have been in service in the Fulton Street subway station, New York, for 17 months without getting slippery even at the nosing. Considering the enormous traffic this speaks well for the wear resisting qualities of Feralun. The upper flight of this installation has been exposed to the weather without any protection through two winters and it is a noticeable fact that when there is a slight crust of snow, mud or ice the efficiency is in no way lessened, because the sharp points of corundum cut through and grip the pedestrians' shoes.

As the heel can catch in the channels of treads with ribs parallel to the edge of the step, causing serious injuries, it has been found desirable to use only those treads with a perfectly plain surface or with a square hatch surface design having channels diagonal to nosing. Feralun treads are made in any surface design required, but the manufacturers recommend only the square hatch or plain surface. In most of the so-called safety treads the element intended to prevent slipping soon wears even with or below the metal ribs containing it, thus becoming valueless. Contact of pedestrians' shoes is then with the slippery metal only. This condition usually occurs in a few months of average service. If there is mud, ice or snow on those treads they give a very dangerous footing. A plain polished metal plate would be as good. In Feralun treads such a condition is impossible. Feralun treads are made to wear and to prevent slipping. They do this better than anything else on the market and considering their great durability the cost is very low.

When considering new construction it is well to provide for the best in the first place and also to arrange for economical renewals if traffic is more than ordinarily heavy. For wood stairs a plate of Feralun can be applied in a recess of the wood tread. The same form of construction is frequently employed with iron stairs by using a recessed or panelled cast iron tread with a plate of Feralun bolted fast with stove bolts in countersunk holes. Many factory stairs are now made of reinforced concrete which seems to be a popular form of construction; but the edges of the steps must have some protection from chipping and wear as well as an anti-slip element. Feralun treads are embedded flush with the finished surface of the steps as shown in the sectional view. It should be in two sections, a front and a back, because the front piece gets two or three times as much wear. The advantage of two sections is obvious when considered from a maintenance standpoint. They are attached with wood screws to oak blocks embedded in the concrete and these in turn are held down with metal anchors and bolts as shown. The advantages of this method are so decided when making renewals that it is strange it is not more universally used.

Fig. 2 shows in detail a section through a step as constructed in the new subway work in New York City in accord with plans and specifications of the public service commission of that district.

For floor plates, steps, running boards, etc., in boiler and engine rooms there is nothing equal to Feralun. It is the most durable material and oil from the machinery may cover it without lessening its efficiency as an anti-slip surface. Fig. 3 shows Ferulum steps and running boards around moving machinery.

Because of its resistance to abrasion Feralum is used for locomotive sander elbows, liner plates and discharge pipes for centrifugal dredge pumps, ash ejector elbows and wearing backs, and liners for rock crushers. In this latter service Feralun lasted three months without appreciable signs of wear. Cast iron lasted four days and chilled iron two weeks in this particular service.

Feralun also resists the action of dilute acids and other corroding agents. It is

therefore invaluable for use around mines and industrial plants, as ash and coal down takes and hoppers in power plants, mine pumps and runners, culm and slush line pipe, valves and fittings, and jig grates. Feralun jig grates in anthracite coal mines withstand the action of both acid and abrasion for nine months to a year, where ordinary cast iron pits out and shakes to pieces in from three to four months.

The high melting point of corundum, its non-conductivity of heat and low coefficient of expansion enables Feralun to withstand the deleterious effects that hot gases, ashes and other hot materials have on iron and steel, such as pitting, rapid expansion and contraction and fusing. The invention of Feralun, which is protected by patent, is a noteworthy advance and after a long time spent in experimenting, the perfected product in its varied forms fills a long-felt want in many lines. Textile manufacturers will find Feralun safety treads and floor plates very desirable because of their exceptional durability and efficiency as a preventative of accidents.

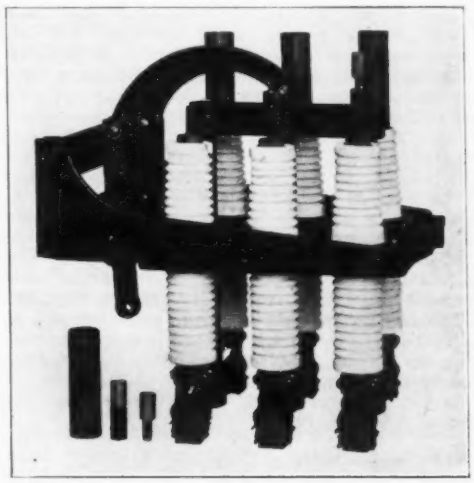
A NEW TYPE OF OIL BREAK SWITCH

A new type of oil break switch has lately been placed on the market by the General Electric Company for use on circuits where the potential does not exceed 15,000 volts. Oil break switches are being used in many textile mills to prevent the danger of fire where loose inflammable fibers are floating in the air.

A straight line operating mechanism is employed, which, with the exception of the operating lever and its connecting link, is entirely mounted upon the switch frame. This mechanism gives a vertical parallel movement to the movable contact blades, and both obviate the danger of friction or binding and increases the speed of the switch break. This mechanism is adjusted at the factory and requires no further adjustment.

The fixed contacts are of the well known drop forged copper, flared finger type. The movable contacts are wedge shaped copper blades, each provided with a slot in the upper extremity, permitting a jet of oil to be forced into the arc on rupturing the circuit. This assists in extinguishing the arc quickly and reduces the disturbance in the oil vessel.

This construction insures clean contact surface and good contact under pressure over the entire surface and also prevents burning and pitting the contact surfaces, in-



AN OIL BREAK SWITCH.

asmuch as the arc is not ruptured between the actual contact surfaces but between the upper extremity of the moving contact and the flared portion of the stationary contact.

The insulators are of one-piece glazed porcelain of the highest grade, corrugated to give large creepage surface. Each insulator extends below the oil level and is clamped to the frame by two metal plates and four cap screws, eliminating the use of babbitt or cement. The insulators are interchangeable. The switch being a self-contained unit is conveniently handled and installed without interfering with the alignment. The arrangement of terminals employed saves time and labor in installing or disconnecting.

In the form K-12 oil break switch, greater striking and arc over distances, greater oil and greater air spaces are secured.

The average weekly consumption of cotton in the United States in 1910 amounted to about 92,000 bales, compared with 108,000 in 1909; 87,000 in 1908, and 96,000 in 1907.

Mill News

Those interested in receiving early and more complete investigated information of projected new mills, enlargements, improvements, fires, facts and gossip of the trade are referred to the TEXTILE ADVANCE NEWS, issued weekly by the publishers of the TEXTILE WORLD RECORD, at $15.00 per year.

COTTON.

New Mills.

Connecticut, Plainfield. Ground has been broken for a 3-story brick spinning mill and 1-story weave shed for the Plainfield Mills Corp., a $600,000 company controlled by the same interests that control the Lawton Mills Corp. Cotton and silk goods will be manufactured. In addition 60 tenement houses for operatives will be constructed. While the new plant will be so constructed that it will be practically a continuation of the plant of the Lawton Mills Corp., it will be owned by a separate concern. Harold Lawton will be vice-president and general manager of both companies. The weave shed will be a 450-foot continuation of the Lawton Mills' weave shed where it will rise 3 stories for the spinning mill and extend 450 ft. farther. The equipment will include 60,000 spindles for making fine combed cotton goods. The same office quarters will be occupied by the Lawton Mills Corp. and the Plainfield Mills Corp., necessitating an enlargement of the present office building.

Georgia, Monticello. The Castle Cotton Mills, Ltd., have formally organized with Wm. T. Lang as president. The directors include L. O. Benton, H. V. D. Allen, E. H. Jordon, R. L. Davis and H. D. Massee of the Central Georgia Power Co. of Macon.

Georgia, Statesboro. A company is being organized to build a mill for spinning Sea Island cotton. The enterprise is promoted by Sea Island cotton growers and a committee from their number, consisting of A. M. Deal, S. L. Nevils and B. E. Olliff, has been appointed to formulate plans.

*North Carolina, Mt. Holly. Plans for the Energetic Mfg. Co., promoted by Geo. A. Howell, call for a main mill, 307 by 78 ft., 1 story high. The equipment will include 5,000 ring spindles with preparatory machinery, all to be driven by electric motors. Mr. Howell's present address is 1103 Mint St., Charlotte.

*North Carolina, Winston-Salem. The Inverness Mills Co. has equipped its plant with 8,000 spindles and 200 40-inch automatic looms and plans to make book cloths, sheetings, drills and prints. Electric power will be obtained from the Winston-Salem transmission lines of the Southern Power Co. H. G. Chatham is president; John L. Gilmer, vice-president, and Lawrence MacRae, secretary and treasurer.

*South Carolina, Greenville. Good progress has been made on the construction of buildings for the Westervelt Mills and work will soon be started on the second floor of the main structure. As noted in earlier reports, this plant will have 50,000 spindles and 1,200 looms for manufacturing fine lawns and linons. The capital stock is $1,000,000. J. W. Westervelt is president and manager.

*South Carolina, Newberry. A 4-story main building, 130 by 216 ft., has been built for the new Oakland Cotton Mills and will be equipped with 20,000 spindles and 500 looms. Work will now be started on 60 operatives' cottages. The Fiske-Carter Construction Co. are the building contractors and Lockwood, Greene & Co. are the architects-engineers. This company was incorporated several months ago with capital stock of $400,000.

Texas, Waco. The Central Texas Finance Co. is organizing the Waco Cotton Mill Co. with capital stock of $200,000 to build and operate a cotton twine plant of 5,000 spindles. One-half of the amount has been subscribed by business men. E. F. Drake, secretary of the Business Men's Club, heads the project, and should be addressed regarding it.

*Vermont, Brattleboro. Work has been started on the foundations for the Fort Dummer Mills. The Bishop Construction Co. has the contract and it is planned to have the buildings ready for machinery in four months.

Enlargements and Improvements.

Alabama, Huntsville. Additions are being made to the equipment of the dyeing department of the Lowe Mfg. Co.

*Alabama, Siluria. Work has been started on the new mill which is to form a part of the improvements at the Siluria Cotton Mill, now known as the Buck Creek Cotton Mills Co. The Siluria Cotton Mill Co. has been discharged from bankruptcy, following the reorganization.

Canada, Nova Scotia, Halifax. There is no likelihood of the local plant of the Dominion Textile Co. shutting down. The indications are rather that the output will be increased by the installation of some of the equipment of the Windsor plant, which has shut down as noted. The machinery brought from Windsor is more modern than some of the old equipment in operation here which is being used to replace it.

Connecticut, Danielson. The Connecticut Mills Co., a concern which is operating about 20 looms on tire fabric, has changed from steam to electric power.

Georgia, Barnesville. A 2-story brick building, 100 by 240 ft., will be built for the Aldora Mills and looms will be installed, changing the production from cotton yarns to woven goods. The change will represent an investment of about $150,000. Contract has been made with the Central Georgia Power Co. for electric power to drive the entire

mill. It is expected the changes will be completed by September 1.

Georgia, Carrollton. Extensive additions and changes are planned by the Mandeville Mills. It has been decided to erect a 3-story addition to the main building, 100 by 112 ft., and a 100-foot addition to the picker room of No. 2 yarn mill and to install 10,000 spindles next fall. It is estimated that $130,000 will be expended in these yarn mill additions. The company has placed a trial order for 20 automatic looms and if these are satisfactory on their product, it is proposed to order 120 more, giving a total of 140 automatic looms, which will replace the present equipment of 120 plain broad looms. With this installation the company will weave all the yarn spun in No. 1 spinning mill instead of selling part of it as at present. Drills and 30s and 40s yarns are manufactured. L. C. Mandeville is president; N. N. Johnson, secretary; H. O. Lovvorn, treasurer and buyer, and J. A. Mandeville, manager.

Georgia, Columbus. The Swift Mfg. Co. has awarded contract to T. C. Thompson & Bros. of Birmingham and Charlotte, for the construction of two additions. Colored cotton goods and Mitcheline spreads are manufactured on 18,000 spindles, 24 broad and 414 narrow looms.

*Massachusetts, Chicopee. Chas. T. Main, mill-engineer and architect, Boston, prepared the plans for the new No. 1 Mill of the Dwight Mfg. Co. and contract for construction work was awarded through his office to Caspar Ranger of Holyoke. As noted, the structure will be 545 by 113 ft., 5 stories and basement.

Massachusetts, Three Rivers. An addition will be built to the weave shed of the Otis Co. As noted several months ago, the plant is to have a total capacity of 2,000 looms.

*New York, Lestershire. Larger quarters are to be secured by the Lestershire Towel Mills, a new corporation recently organized to succeed the Corliss Towel Mills, and when this is done additional looms will be installed. They will make towels and toweling. The officers are John J. McDavitt, president; R. M. Davidson, treasurer and general manager, and M. K. Sheridan, secretary.

New York, Utica. Another floor giving 15,000 additional feet of floor space is to be built on the La Tosca Yarn Mill, a department of the Mohawk Valley Cap Factory. The work will be started at once and will probably be completed in July. The mill was originally constructed so that additional floors could be built on with little difficulty and this change will make a 4-story instead of a 3-story mill, which will relieve the congestion in other parts of the plant and provide room for additional machinery.

North Carolina, Charlotte. According to reports the Fidelity Mfg. Co. plans to install looms for weaving damask.

North Carolina, Double Shoal. An improvement is to be made in the water power plant of the Double Shoal Cotton Mills, and James Leffel & Co., of Springfield, Ohio, have been engaged as engineers.

North Carolina, Franklinville. The Randolph Mfg. Co. has purchased 178 automatic looms which will be installed as soon as they are received.

North Carolina, Gastonia. Contract has been awarded by the Arlington Cotton Mills to John McAllister for an addition. Six combers will be installed in the new space for the present. Later on as conditions justify, other combers will be installed until the entire output is combed goods.

North Carolina, Lincolnton. A small amount of new machinery equipment is being installed by the Rhodes Mfg. Co.

*North Carolina, Newton. Canton flannels will be woven in the new weaving department of the Newton Cotton Mills. The equipment will consist of 60 looms.

North Carolina, Rockingham. A 1-story addition, 62 by 114 ft., will be built by the Roberdel Mfg. Co. and equipped with the present beaming and slashing equipment. The space now occupied for beaming and slashing will then be equipped with 98 4 by 1 box looms.

North Carolina, St. Pauls. The St. Pauls Cotton Mill Co. will increase its output 50 per cent. and has awarded contract for new machinery, including 7 cards, 12 deliveries of drawing, 11 spinning frames and 2 speeders. Knitting yarns are spun.

North Carolina, Spray. Contracts have been placed for new dyeing and bleaching equipment to be installed in the Lily Mills.

North Carolina, Spray. The looms of the Nantucket Mills are being equipped with warp stop motions and a new boiler is being installed. This is one of the mills controlled by Marshall Field & Co. of Chicago.

*Pennsylvania, Glen Riddle. No machinery or stock in the main mill of the Penn Tapestry Co. was damaged by the recent fire. The dye house, dry house, drug room and yarn storehouse were entirely destroyed and arrangements have been made to have their dyeing done in Philadelphia temporarily. As soon as the insurance is adjusted immediate steps will be taken toward rebuilding the destroyed departments.

Pennsylvania, Philadelphia. Thomas Davies, operating 20 looms on upholstery fabrics at Orthodox and Large Sts., Frankford, is arranging for the erection of a frame addition, 620 sq. ft., to his present building, in which he will install beaming machinery.

Pennsylvania, Philadelphia. Chas. H. Feldstein & Co., 4264 Paul St., manufacturers of hair cloth, report that they are increasing their equipment from 77 to 102 looms and have also started up an annex in another section of Frankford.

Rhode Island, Berkeley. Extensive changes are being made in the power department of the Berkeley Co., including the installation of a new boiler. Sixty-four looms have been set up in the new weave shed and are in operation.

(Continued in Advertising Section.)

Personals

Edward C. Russell has been appointed second hand in the finishing department at the Huntington Mfg. Co., Huntington, Mass. He was formerly employed at the Oneko Mill, New Bedford, Mass.

P. T. Wing has accepted the position as overseer of spinning at the A. H. & C. B. Alling Company, Derby, Conn. He was formerly employed at the Beacon Mfg. Co., New Bedford, Mass.

James Lapraik has accepted the position as overseer of dyeing at the Dustin Island Woolen Mills, Penacook, N. H.

Morris Watkins has accepted the position as overseer of spinning and twisting at the Royal River Mfg. Co., Yarmouth, Me. He comes from Lewiston, Me.

Robert M. Wheaton has accepted the position as superintendent of the Chicago Hammock Co., Chicago, Ill. He comes from New Brunswick, N. J.

Chas. Farlick has accepted the position as overseer of carding at the Woodside Woolen Co., Northboro, Mass. He comes from New Bedford, Mass.

Arthur Dickson, superintendent of the Nonquit Mill, New Bedford, Mass., has severed his connection with that company.

Edward W. Morgan, overseer of dyeing at the Rosemont Woolen Co., Almonte, Ont., Canada, has severed his connection with that company.

P. J. Carey has accepted the position as overseer of finishing at the James & E. H. Wilson Mill, Pittsfield, Mass. He comes from the South Bend Woolen Co., South Bend, Ind.

Frederick P. Farron, overseer of carding at the E. E. Hilliard Company, Buckland, Conn., has resigned to accept a similar position with the Geo. H. Gilbert Mfg. Co., Gilbertville, Mass.

James Stritch, overseer of carding at the Geo. H. Gilbert Mfg. Co., Gilbertville, Mass., has severed his connection with that company and is to retire from active service.

Thomas Costello has accepted the position as overseer of dyeing for the S. F. Cushman & Sons Mill, Monson, Mass. He was formerly employed for the Ellis Ricketts Mill, same town.

Wm. Harriman, overseer of weaving at the Waterhouse & Howard Mill, North Adams, Mass., has severed his connection with that company. He was presented with a purse of gold on his retirement.

John E. Tobin has accepted the position as overseer of weaving at the China Mill, Suncook, N. H. He was formerly employed at the Warren Mfg. Company, West Warren, Mass.

Geo. Cooper has accepted the position as overseer of spinning at the Rodman Mfg. Co., Allenton, R. I. He was formerly employed at the Whitin Machine Works, Whitinsville, Mass.

Ronald Lyman has been appointed treasurer of the Salmon Falls Mfg. Co., Salmon Falls, N. H. He is also treasurer of the Boston Mfg. Company, Waltham, Mass., and the Whittenton Mfg. Co., of Taunton, Mass.

R. L. Cumnock, Sr., general manager of the Brogon Cotton Mill, Anderson, S. C., has been appointed general manager of the Alta Vista Cotton Mill, Alta Vista, Va.

John H. Estes has been chosen president of the Chace Mill, Fall River, Mass., to succeed the late Edward E. Hathaway.

H. C. Taylor, superintendent of the Dominion Textile Company's Bleachery, Colonial Branch, Montreal, Canada, has severed his connection with that company. Paul Wardale succeeds him and comes highly recommended, having been employed in large mills in the United States and England.

John T. Scott, designer at the Avon Mills, Gastonia, N. C., has resigned to accept a similar position with the Huss Mfg. Co., Bessemer City, N. C.

P. A. Bolt, overseer of carding at the Apalache Mills, Arlington, S. C., has resigned to accept a similar position with the Jackson Mills, Iva, S. C.

L. P. Darnell, overseer of spinning at the Maple Croft Mills, Liberty, S. C., has resigned to accept a similar position at the Issaqueena Mills, Central, S. C.

J. C. Tiddy, overseer of night carding at the Shelby Cotton Mills, Shelby, N. C., has resigned to accept a position as overseer of carding at the Osage Mills, Bessemer City, N. C.

Oscar R. Johnson, overseer of dyeing at the Delgado Mills, Wilmington, N. C., has resigned to accept a similar position at the Belleville Mills, of the same city.

H. F. Howard, overseer of spinning at the Jackson Mills, Iva, S. C., has resigned to accept a similar position with the Alice Mills, Easley, S. C.

G. H. Riddle, overseer of weaving at the Rhode Island Mills, Spray, N. C., has resigned to accept a similar position with the Patterson Mills, of Roanoke Rapids, N. C.

W. H. Gurley has accepted a position as overseer of weaving at the Sanford Cotton Mill, Sanford, N. C., succeeding Ira D. Bridgers.

J. E. Wright, overseer of weaving at the Highland Park Mill, No. 3, Charlotte, N. C., has resigned.

Geo. W. Harrington has accepted the position as overseer of carding and spinning at the Lawrence Webster Co., Malone, N. Y. He was formerly employed with J. A. Humphrey & Son, Moncton, N. B., Canada.

H. B. Sharp, overseer of carding at the Lowe Mills, Huntsville, Ala., has resigned to accept a similar position with the Floyd Mills, Rome, Ga.

Chas. H. Keates has accepted the position as overseer of spinning at Quechee, Vt., in the mill

operated by the Dustin Island Woolen Mills, Penacook, N. H.

John A. Hawkinson has accepted a position as percher at the Marston Worsted Mills, Skowhegan, Me. He was formerly employed as assistant finisher at the Huntington Mfg. Co., Huntington, Mass.

Robert E. Horne has accepted the position as overseer of weaving at the Ballard Vale Mills, Ballard Vale, Mass. He comes from Lawrence, Mass.

S. H. Howard, formerly superintendent of the Holt-Williamson Mills, Fayetteville, N. C., has accepted the position as superintendent of the Harden Mfg. Co., Worth, N. C.

Paul Bolt, overseer of carding at the Apalache Mill, Arlington, S. C., has resigned to accept a similar position at the Jackson Mill, Iva, S. C.

A. P. Richie, overseer of spinning at the Majestic Mills, Belmont, N. C., has resigned to accept a position at the Drayton Mills, Spartanburg, S. C.

C. L. Kent, overseer of carding at the White Hall Yarn Mills, White Hall Ga., was recently promoted to the position of superintendent of the same mills.

Geo. Riddle has accepted the position as overseer of weaving at the Patterson Mill, Roanoke Rapids, N. C. He comes from Spray, N. C.

G. L. King has been appointed overseer of carding and spinning at the Century Cotton Mills, South Boston, Va.

Harry L. Crocker has been appointed superintendent of the Esmond Mill, Esmond, R. I., succeeding W. S. Trickett. Mr. Crocker comes from the Amoskeag Mfg. Co., Manchester, N. H.

Frank Edgerton, overseer of weaving at the Garland Woolen Co., Staffordville, Conn., has severed his connection with that company.

J. A. Jubb has accepted the position as overseer of finishing at the Black River Woolen Co., Ludlow, Vt.

Frank Scoon has accepted the position as designer at the Ounegan Mill, American Woolen Co., Old Town, Me. He was formerly employed at the Earnsdale Worsted Co., Clinton, Mass.

E. H. Boyce has accepted the position as overseer of finishing at the Wuskanut Mill, Farnumsville, Mass., succeeding Jos. Shaughnessey. He comes from the Victor Mfg. Co., Clinton, Mass.

P. H. Manning has accepted a position as overseer of carding for Jos. Noone's Sons Co., Peterboro, N. H. He comes from Waterville, Me.

Wm. Morgan, overseer of spinning at the Oneko Mill, New Bedford, Mass., has resigned to accept a similar position with the Beacon Mfg. Co., same city.

Wm. Spencer, for twenty-three years overseer of ring spinning at the Linwood Cotton Mill, Whitinsville, Mass., has resigned to accept a similar position with the Blackstone Mfg. Co., Blackstone, Mass.

Geo. McKenzie has accepted the position as overseer of dyeing at the Fletcher Mfg. Co., Providence, R. I. He was formerly employed at Pawtucket, R. I.

E. S. Reynolds has accepted the position as overseer of finishing at the Falls City Woolen Mill, Louisville, Ky.

John Swanson has been appointed assistant superintendent of the Crompton Mill, Crompton, R. I.

Robert Johnson, overseer of spinning at the Peace Dale Mfg. Co., Peace Dale, R. I., has severed his connection with that company.

Joseph J. Sharkey, master mechanic at the Pemberton Mill, Lawrence, Mass., has severed his connection with that company.

J. W. Quinn has been appointed superintendent of the Middleburg Mills, Batesburg, S. C. He comes from Westminster, S. C.

W. C. Burns, superintendent of the Cherokee Mills, Griffin, Ga., has resigned.

W. H. Shumate has been promoted to overseer of weaving at the Nantucket Mills, Spray, N. C.

Joe Brown has accepted the position as overseer of spinning at the Harriss Mfg. Co., Rock Hill, S. C. He comes from the Highland Park Mill, of the same city.

C. H. Phillips has been appointed superintendent of the Hopedale Mill, Burlington, N. C.

Hollis Davis has accepted the position as overseer of carding at the Tallassee Falls Mfg. Co., Tallassee, Ala. He comes from Evansville, Ind.

Abe Mauney has accepted the position as overseer of carding and spinning at the Tuckaseege Mfg. Co., Mount Holly, N. C.

Byron F. Card, superintendent of the Tallassee Falls Mfg. Co., Tallassee, Ala., has resigned to accept a similar position with the Kansas City Cotton Co., Kansas City, Mo.

L. W. King, superintendent of the Marble City Mills, Sylacauga, Ala., has resigned to accept a similar position at the Century Cotton Mills, South Boston, Va.

Oliver J. Purnell has been appointed superintendent of the Wright's Health Underwear Co., who operate mills at Cohoes and Troy, N. Y. He comes from the Purnell Mfg. Co., Pittsfield, Mass.

J. M. Masson, agent of the Oneko Mill, New Bedford, Mass., has severed his connection with that company, resignation to take effect April 29.

Chas. Moss has accepted the position as overseer of weaving at the Berkshire Mfg. Company's mill at North Pownal, Vt.

James E. Clark has been appointed general superintendent of the Otis Co., Ware, Mass.

Sidney C. McHenry has been appointed assistant superintendent of the cloth department and J. D. Clark has succeeded Sidney McHenry as overseer. This change was made by the resignation of E. E. Orrell.

Edward P. Nichols, treasurer of the Salmon Falls Mfg. Co., Salmon Falls, N. H., has resigned. The position has been offered to his son, H. S. O. Nichols.

A. L. Cochrane, designer at the Bound Brook Woolen Co., Bound Brook, N. J., has severed his connection with that company.

E. W. Morgan, overseer of dyeing at the Rosemont Woolen Co., Almonte, Ont., has resigned. His successor is Thomas Speak of Rhode Island.

John H. Bateman has accepted the position as assistant superintendent and designer in the worsted department at the Orr Felt & Blanket Co., Piqua, Ohio. He comes from the French River Textile Co., Mechanicsville, Conn.

Henry G. Jackson has been appointed manager of the Clyde Print Works, Riverpoint, R. I., to succeed John R. Butterworth. Mr. Jackson is a son of the president, B. A. Jackson, of the S. H. Greene & Sons Corporation.

Michael Donahue has been appointed superintendent of the velvet mill of Cheney Bros., South Manchester, Conn. He will be succeeded at the Bigelow Mill by Cyrus Wheaton, who has been superintendent of the mill at Middletown, operated by the same company.

Lees Mallinson, overseer of finishing for the past 8 1/2 years at the Coronet Mill, Mapleville, R. I., has resigned. He is succeeded by Frank Perkins, who comes from Nasonville, R. I.

N. B Davis has accepted the position as overseer of spinning at the Amazon Mills, Thomasville, N. C. He comes from the Young Hartsell Mills, Concord, N. C.

J. F. Keeter has accepted a position as overseer of carding at the Highland Park Mill, No. 1, Charlotte, N. C.

M. B. Cockman has accepted the position as overseer of dyeing at the Locke Mill, Concord, N. C. He comes from the Belwill Mill, Wilmington, N. C.

George Schulz, for the past two years assistant to the superintendent of the Phillipsdale branch of the Glenlyon Dye Works, has recently resigned to take charge of the bleaching and mercerizing at the works of the Manville Co. at Manville, R. I.

James Henry has accepted the position as overseer of weaving at the Glenside Woolen Mill, Skaneateles Falls, N. Y.

Wilford Reynolds has accepted the position as overseer of carding and spinning at the Ohio Yarn Mills Co., Cleveland, O. He comes from Lockport, N. Y.

Arthur Firth, overseer of carding at the New York Mills, New York Mills, N. Y., has severed his connection with that company.

Edwin M. Converse has accepted the position as overseer of carding and spinning at the Faribault Woolen Mills Co., Faribault, Minn. He was formerly employed at the Ohio Yarn Mills Co., Cleveland, O.

John E. Gilroy has accepted the position as overseer of spinning at the Burlington Mill, Winooski, Vt. He comes from Hillsboro, N. H.

Henry Schaffer has been appointed superintendent of the Glenlyon Dye Works, Phillipsdale, R. I., succeeding Alfred L. Lustig.

Jno. H. O'Brien, overseer of spinning at the Burlington Mill, Winooski, Vt., has resigned to accept a similar position at the Beaver Brook Mill, Collinsville, Mass.

Thomas Connors, overseer of knitting at the Ellis Mfg. Co., Hamilton, Ont., Canada, has severed his connection with that company.

Geo. F. Maguire, overseer of carding and spinning for several years at the Lawrence-Webster Co., Malone, N. Y., has tendered his resignation on account of ill health.

Wm. Harrower, who retired from active work in 1881, and for a number of years superintendent of the Peace Dale Co., now known as the Peace Dale Mfg. Company, Peace Dale, R. I., died at his home in Wakefield, R. I. He was born in Scotland June 6, 1821.

S. A. Wing, overseer of weaving at the Monohansett Mill, Putnam, Conn., has accepted a similar position with the Bernon Mill, Georgiaville, R. I., succeeding Will Nelson.

Harry J. Silvey has accepted the position as overseer of dyeing at the Yantic Woolen Co., Yantic, Conn. He comes from the Thistle Worsted Co., Danielson, Conn.

Joseph Shaughnessey, overseer of finishing at the Wuskanut Mill, Farnumsville, Mass., has resigned on account of ill health.

R. G. Henderson, for the past two years superintendent of the Carolina Mills Co., Carolina, R. I., severed his connection with that company Saturday, April 29. He was presented with a handsome gold watch, chain and charm with his monogram engraved thereon by the overseers and employes of the mill. The presentation speech was made by H. L. Barber, overseer of finishing at the mill. Mr. Henderson leaves to accept the position as resident agent of the Assawaga Company, Dayville, Conn.

C. W. Everett, second hand in the weaving department at the Globe Woolen Mill, Utica, N. Y., has resigned to accept a position as overseer of weaving at the Burlington Mill, American Woolen Co., Winooski, Vt. Mr. Everett had made many friends while in Utica and they all wish him the best of success.

Byron F. Card, superintendent of the Tallassee Falls Mfg. Co., Tallassee, Ala., has resigned to accept a similar position with the Kansas City Cotton Mill Co., Kansas City, Mo. He is succeeded at the Tallassee Falls Mfg. Co. by J. M. O'Brien, formerly of Asheville, N. C.

Chas. E. Nunn, general superintendent of the Griswold Worsted Co., Darby, Pa., was tendered, by surprise, a farewell dinner in the wool room connected with the mill on his retirement by the company and the overseers employed in the mill. He was presented with a gold watch and chain.

Louis H. Dwyer, overseer of weaving at the Burlington Mill, American Woolen Co., Winooski, Vt., has resigned his position. He was presented with a handsome gold watch by the employes in the weaving department.

Wm. Holdsworth, for the past ten years overseer of weaving at Ricketts & Shaw Mill, Monson, Mass., has resigned to accept a similar position at Guild, N. H. He was presented with a handsome purse of money by the help in his department.

James Marshall, who recently entered the employ of the Oneko Mill, New Bedford, Mass., has been appointed superintendent to succeed J. M. Masson.

A. L. Lustig, late superintendent of the Phillipsdale branch of the Glenlyon Dye Works, Phillipsdale, R. I., is no longer with that concern, connections having been severed the latter part of April. His successor has not yet been appointed.

J. W. Sands has been appointed overseer of finishing at the Oakland Mfg. Co., Reisertown, Md. He comes from Bloomsburg, Pa.

Robert A. Bain, overseer of spinning at the Beaver Brook Mill, Collinsville, Mass., has severed his connection with that company.

Wm. Wood has accepted the position as overseer of carding at the Sawyer, Regan Co., Dalton, Mass. He was formerly employed at Stottville, N. Y.

DEATHS.

Jonathan G. Leinbach, president of the J. G. Leinbach Company, Reading Woolen Mills, Reading, Pa., died at his home in that city at the age of 74 years. He was also president of the Mt. Penn Gravity R. R. Mr. Leinbach was a nominee for Mayor in that city in 1896 and also a veteran of the Civil War.

F. A. Bochmann of the firm of F. A. Bochmann & Co., dress goods manufacturers, Philadelphia, Pa., died at his home in New York City at the age of 74 years. He was born in Saxony, Germany, and came to this country when about 17 years. He established the manufacturing concern which bears his name in 1890, and is survived by a wife and four children.

Albert Howes, master mechanic at the Greylock Mill, Williamstown, Mass., died on Monday, April 24, at the age of 76 years. He had been a native of Williamstown for the past twelve years and previous to that time he worked for the James Hunter Machine Co., North Adams, Mass.

Wm. Pendergast, a respected citizen of Franklin, Mass., died at his home April 19 of diabetes. He was born in Elmira, N. Y., July 2, 1850. Some years ago he held the position as boss carder at the Franklin, Mass., Yarn Mill, the Medway, Mass., Mill and the Concord Mfg. Co., Penacook, N. H. He also traveled on the road setting up machinery for several years. He is survived by a wife, one daughter and three sons.

Henry J. McCune, at one time proprietor of a knitting mill in New York State and superintendent of a number of knitting mills in Amsterdam and Cohoes, N. Y., died at his home in Troy, at the age of 67 years. He is survived by a widow, two daughters and one son.

Frank Everett Weeden, a former resident of Providence, R. I., and for several years superintendent of the Weybosset Mill of that city, died suddenly at the Murray Hill Hotel, New York, as a result of blood poisoning. Since leaving Providence several years ago, Mr. Weeden had held positions with the American Woolen Company's mill at Fulton, N. Y. He was 53 years of age and is survived by a widow.

John O'Neal, formerly superintendent of the Darling Woolen Co., Worcester, Mass., died at his home in that city at the age of 67 years. He is survived by a widow and two sons.

Francis Magee, one of the oldest carpet manufacturers of Philadelphia, and a member of the firm of Irving, Dietz & Magee, died at his home in that city at the age of 76 years.

Herbert W. Barnes, master mechanic at the Whitin Machine Works, Whitinsville, Mass., died of pneumonia after an illness of a few days. He was 53 years of age. He was highly respected by those with whom he was associated.

Joseph T. Sawyer, for many years connected with the Bigelow Carpet Co., Clinton, Mass., and who held a position as overseer of carding at this mill for a number of years, died at the age of 64 years. He is survived by a widow.

Louis F. Grannes died at his home in Allentown, Pa., at the age of 66 years. Mr. Grannes had been an inventor of knitting machinery and was well known among the trade.

Edward E. Hathaway died at his home in Fall River, Mass., at the age of 74 years. At the time of his death he was president of the stafford, Chace and Granite Mills, director of the Osborn Mill and treasurer of the Citizen's Saving Bank and the Pocasset National Bank.

Ezekiel McCleary, foreman of the rug department at the firm of McCleary, Wallin & Crouse, Amsterdam, N. Y., died at his home in that city of apoplexy at the age of 51 years. He leaves a widow, four daughters and three sons.

James Titherington, superintendent of the Barnesville Mfg Co., Fairmont, W. Va., died at his home at the age of 65 years. He had been connected with the Barnesville Mill for over forty years and is survived by one son.

Joseph Randall, a son of Thomas Randall, died at his home, 116 East Upsal St., Germantown, Philadelphia. He was a member of the firm of J. Randall & Co., woolen yarn manufacturers. He was 77 years of age and born in Norristown, Pa. Mr. Randall was a member of many organizations.

Recent Textile Patents

CLOTH SPREADER and Guider. 992,703. Albert Birch, Belmont, Mass.

DYEING or Similarly Treating Textiles. Apparatus for. 993,324. John C. Hebden, Providence, R. I., and Frederick H. Daniell, Franklin, N. H.

DYEING MACHINE. 992,365. Alexander Ligget, Philadelphia, Pa.

EMBROIDERING MACHINE Shuttle Mechanism. 991,636. Morris Schoenfeld, Rorshach, Switzerland.

FABRIC and Treating the Same. 991,988. Nathan Hirsch, New York.

FABRICS. Device for Restoring Nap to. 992,175. George B. Dexter, Brookline, Mass.

FIBROUS PLANTS. Machine for Treating. 991,557. Wilbur M. Stone, New York.

KNITTING MACHINE. Circular Rib. 992,012. F. Lasher.

KNITTING MACHINE. Circular Fashioning. 991,711. Emil J. Franck, Philadelphia, Pa.

KNITTED WEB. 993,112. Robert W. Scott, Leeds Point, N. J.

KNIT or Woven Fabric or Felted Boot. 993,203. Frederic W. Savage, Granville, N. Y.

KNIT FABRICS. Trimming Attachment for Machines for Uniting. 992,116. Edwin O. Davis, Paducah, Ky.

LOOM FILLING-Exhaustion-Indicating Mechanism. 992,988. Alonzo E. Rhoades, Hopedale, Mass.

LOOM THREAD Parting Mechanism. 991,484. Edward Cunnif, New Bedford, Mass.

LOOMS. Filling Carrier for Automatic Feeder. 992,989. Alonzo E. Rhoades, Hopedale, Mass.

SHUTTLE MECHANISM for Embroidering Machines. 991,656. Morris Schoenfeld. Rorschach, Switzerland.

SILK. Treating. 992,803. Solomon B. Rains, Brooklyn, N. Y.

SHUTTLE. 992,452. David B. Saunders, Gloucester, Mass.

SHUTTLE-REPLENISHING Mechanism. 991,655. Morris Schoenfeld, Rorschach, Switzerland.

SPINNING and Roving Machine Spindle. 993,080. James C. Leslie, Dundee, Scotland.

SPINNING and Twisting Machines. Guide Wire for. 991,555. George E. Spofford, Blackstone, Mass.

SPINNING MACHINE. Rotary Rivet. 992,208. Jere G. Kingsbury, Bridgeport, Conn.

THREAD DISPENSER. 992,324. Edwin L. Yale, Lansing, Mich.

THREAD FINISHING Machine. 991,856. William C. Keyworth, Paterson, N. J.

THREAD GUIDE and Cleaner. 991,899. John F. Schenck, Lawndale, N. C.

WINDING MACHINE. 992,669. Solomon Kendrick, Rochester, N. Y.

WINDING MACHINE. 993,151. Robert C. Campbell, Harlan, Ia.

YARN CLEANSING Apparatus. 991,510. Robert G. Jennings, Elmira, N. Y.

RECENT TEXTILE TRADE MARKS REGISTERED

"Century." Hosiery. Century Knitting Mills, South Boston, Va.

"Angomore." Sweaters and knit goods. Morgan Knitting Mills, New York.

"High School." Boys' coats, vests and trousers. Popular Dry Goods Co., El Pasa, Tex.

"Rondar." Cotton piece goods. Wm. Simpson Sons & Co., Philadelphia, Pa.

"Verite." Ladies' coats and suits. Louis Goldstein, New York.

"St. George's." Woolen underclothing. Fleming, Reid & Co., Ltd., Freenock, Scot.

"Springfield." Knit underwear. Springfield Knitting Co., Springfield, Mass.

"Venus." Hosiery. The Pittsburg Dry Goods Co., Pittsburg, Pa.

"Diana." Hosiery. The Pittsburg Dry Goods Co., Pittsburg, Pa.

"The Fco." Sweaters and knit goods. Morgan Knitting Mills, New York.

"Carl Freschl." Hosiery. Holeproof Hosiery Co., Milwaukee, Wis.

"Norpa." Aprons. S. A. Diamond & Bro. Co., New York.

"Waldorf." Dress braids. Syracuse Dry Goods Co., Syracuse, N. Y.

"S. B. H." Handkerchiefs. Stringham & Bauer, New York.

"Onyx." Dress shirts. Oppenheim, Oberndorf & Co., Baltimore, Md.

"Niagara Maid." Silk hosiery, undershirts, vests, etc. Niagara Silk Mills, North Tonawanda, N. Y.

"Welcome." Ladies' hosiery. Thieme Bros. Co., Fort Wayne, Ind.

"Romanese." Hosiery. Wm. B. Threapleton's Sons, Philadelphia, Pa.

"Hector." Hosiery. Bellas Hess & Co., New York.

"Oneida." Spool Silk. Oneida Community Co., Oneida, N. Y.

"Liberty." Hosiery. The H. B. Claflin Co., New York.

"Logico." Knitted Underwear. Elk Knitting Mills Co., Philadelphia, Pa.

"Rose." Cotton Bedspreads. The Pittsburg Dry Goods Co., Pittsburg, Pa.

"Tri Bar." Cotton and Linen Piece Goods. Trippe Barker & Co., New York.

New Publications.

[Any work noticed under this head can be obtained through the office of this journal.]

The Principles of Scientific Management; by Frederick Winslow Taylor; 144 pages, 5 3/4 by 8 3/4; Harper & Bros., Franklin Sq., New York.

This book is written by one of the pioneers of what is now known as scientific management. Mr. Taylor has not only shown that he can talk efficiency, but that he can practice efficiency, and for the latter reason in particular his book deserves careful study. Back of the question of efficiency is a problem of conserving material resources and thus lengthening the period during which mankind can exist on this planet. In the introduction Mr. Taylor makes the following statement of the objects which he has kept in mind in writing the book:

First, To point out, through a series of simple illustrations, the great loss which the whole country is suffering through inefficiency in almost all our daily acts.

Second, To try to convince the reader that the remedy for this inefficiency lies in systematic management, rather than in searching for some unusual or extraordinary man.

Third, To prove that the best management is a true science, resting upon clearly defined laws, rules and principles, as a fountain. And further to show that the fundamental principles of scientific management are applicable to all kinds of human activities, from our simplest individual acts to the work of our great corporations, which call for the most elaborate cooperation. And, briefly, through a series of illustrations, to convince the reader that whenever these principles are correctly applied, results must follow which are truly astounding.

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Cost-Keeping for Manufacturing Plants; by Sterling H. Bunnell; 233 pages, 6 by 9; D. Appleton & Co., 29 West 32d St., New York.

Cost-keeping for manufacturing plants is based on certain fundamental principles which are the same for all industries, and this work will be found of value to textile manufacturers by reason of its dealing with these principles. The scope of the book is indicated by the following abstract from the table of contents: General Principles of Cost Accounting, Elements of Cost of Manufactured Product; Introducing a Cost System, The Factory Order, The Cost of Material, The Cost of Labor, Cost of the "Sundries," The Classification of Non-productive Expense, The Distribution of Burden, The Computation of Correct Burden Rates, The Accurate Method of Taking Inventory; The Routine of Cost-Keeping, The Periodic Reports, The Proper Use of the Cost System.

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The Elimination of Vapor from Work Rooms (Elimination des Buees Industrielles); by Paul Razous; 65 pages, 6 1/2 by 10; Societe d'Editions Techniques, 16 Rue du Pont-Neuf, Paris, France.

Beginning with the general conditions affecting the formation and removal of vapor in work rooms, the author considers the subject under the following heads: Mathematical and Physical Problems of Removing Vapor, Displacement of Air; Installations for Removing Vapor in Dye Houses; Removing Vapor from Silk Spinning Mills, Installations for Removing Vapor from Work Rooms in Various Industries. The book is freely illustrated and the text is in French.

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Motion Study; by Frank B. Gilbreth; 116 pages, 5 by 8; D. Van Nostrand Co., 23 Murray St., New York. Price $2.

This work originally appeared in "Industrial Engineering" and is now issued in book form. The author is a sufficient guarantee that the book is thoroughly practicable, as Mr. Gilbreth has made many efficiency records in the construction of buildings and other works. He deals with the subject under the following heads: Description and General Outline of Motion Study; Variables of the Worker; Variables of the Surroundings; Variables of the Motion; Past, Present and Future of Motion Study.

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Business Literature.

Tool Steels: Catalogue D; 128 pages; Field & Co., Inc., Philadelphia, Pa.

This catalogue contains valuable information to manufacturers of textile and knitting machinery. It includes also comprehensive working directions for all those who have to make tools from steel, showing the best way to get good results from tool steel, the necessary heat for forging, how to handle tongs so as not to affect the temper of the steel, allowance that should be made for finishing, how steel should be broken, ground, heated for hardening, allowances to be made for expansion and contraction, how to avoid defects in hardening, and many other technical points of great value. The different kinds, sizes and prices are given of ring and dial forgings, cold rolled spring steel strips and wires, ground turned and polished shafting, seamless steel tubing, twist drills, milling cutters, etc. The catalogue is well arranged and conveniently indexed. Among other things of interest and value to mill owners are rules for finding the horse power of shafts, for calculating speed of pulleys, and the comparison of temperatures of Fahrenheit and Centigrade.

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Crane and Hoist Motors; The Crocker-Wheeler Co., Ampere, N. J.

A pamphlet which has recently been printed on the subject of crane motors (Bulletin 129) has much in it that cannot fail to be of vital interest to anyone who is in any way responsible for the installation or operation of electric cranes. This pamphlet is handsomely illustrated with half-tone engravings which show many interesting applications of electric motors to cranes and hoists under widely different conditions.

Method of Applying Hosiery Stamps; The Meyercord Company, Inc., of Chicago and Philadelphia.

An envelope filler giving six very simple rules for mounting hosiery stamps, in order to simplify the work and save time. By following these directions operators can stamp from 180 to 250 dozen pairs of hosiery per day.

Direct Current Motors; The Crocker-Wheeler Co., Ampere, N. J.

A pamphlet recently published by this company (Bulletin 132) contains information regarding the design of one line of these machines that cannot fail to be of interest to anyone who uses power driven machinery. The booklet is illustrated by half-tone illustrations of a variety of applications.

Rope Transmission.

The Lambeth Rope Corporation of New Bedford have published a new booklet entitled "The Natural Transmission," giving data and general information regarding transmission rope and rope driving. It describes the manufacture of the Lambeth cotton rope and gives some technical data in regard to splicing, power transmitted, etc.

Lighting the Way to Profits in a Knitting Mill; by J. M. Smith, Manager of the Publicity and Industrial Department of the Buckeye Electric Co., Cleveland, O.

This most interesting paper will be found fully reported in the proceedings of the American Cotton Manufacturers' Association, in another part of this issue, Mr. Smith having been invited to address both conventions, and as the subjects were identical, with some slight modifications, adapting it to the knitting industry, it was deemed unnecessary to repeat the paper here. Mr. Smith's paper was received with marked attention and the comments heard regarding it were very complimentary.

Gasoline Tanks and Storage Outfits; Wm. B. Scaife & Sons Co., Pittsburg, Pa.

This is a 12-page booklet illustrating and describing the Scaife installations for the storage of gasoline.

Industrial Notes

THE REEVES PULLEY CO.'S NEW ENGLAND AGENCY

The Reeves Pulley Company, Columbus, Ind., announce that they have transferred the New England agency for "The Reeves" Variable Speed Transmission from Cell Drier Machine Co. to Lewis E. Tracy Co., 492 Atlantic Ave., Boston, and the agency for "The Reeves" Wood Split Pulley and "The Reeves" Wood Split Pulley Clutch from James H. Roberts & Co. to the Tracy Co.

They state that by thus concentrating their lines under one agency they will be in much better position to serve the New England trade than heretofore. A competent engineer will be in the territory all the time to look after both old and new installations and further the interests of customers.

The Tracy Company will carry a complete stock of standard sizes of "The Reeves" Wood Split Pulleys in order to make prompt delivery of all orders. This company is thoroughly established, wide-awake and aggressive, which in conjunction with the high standard of the goods they propose handling should commend them to every power user in the New England States.

NOTIFICATION TO THE BUYERS OF FRENCH GOODS

Buyers of French goods who wish to apply to the best firms in all lines of goods can secure names and addresses at the "Office National du Commerce Exterieur," 3 rue Feydeau, Paris, which is under the supervision of the Department of Commerce and Industry in Paris. A business directory devised in the clearest manner points out the names of those French firms who wish to export their goods either to foreign markets or the French Colonies. This directory also gives the names of French firms who wish to secure agents for the foreign markets or the markets of the French Colonies.

Firms or agents not having in France regular buyers and who wish to secure the names of manufacturers producing a special class of goods have merely to apply to the Directeur de l'Office National du Commerce Exterieur.

Foreign buyers or agents coming to Paris who might wish to secure commercial information of any kind can have same, free of charge, by applying at the Office National du Commerce Exterieur.

THE ATLANTIC AND GULF MILLS

Albert Rau, 66 Leonard St., New York, has been appointed the sole selling agent for the Atlantic and Gulf Mills, Quitman, Ga., which manufacture strictly high grade combed Egyptian and Sea Island cotton yarns in all counts up to 50s, single and ply in skeins, warps, cones, tubes, etc., in regular or reverse twist. These mills also manufacture cable laid yarns.

PACKING SPOOLS

Mills using packing spools for tapes, braids, etc., might be interested in a spool of fiber material which is especially made for that purpose by Marshall & Sons, Inc., 225 Purchase St., Boston. They have some advantages which are worth investigating.

THE ENFIELD HOSIERY MILLS

Mr. J. P. Quinlan, of 346 Broadway, New York, has been made sole selling agent for the Enfield Hosiery Mills of Enfield, N. C., and the Crown Knitting Mills of Topton, Pa. We congratulate Mr. Quinlan, as well as the mills above mentioned.

A MOVE FOR IMPROVED KNITTING MACHINERY

The recent affiliation of Scott & Williams, Inc. and Geo. D. Mayo Machine Co., the two leading manufacturers of knitting machinery in their respective lines, will have a far-reaching influence on the future production of improved knitting machinery. Although both companies through their advanced knowledge and expert skill have obtained many valuable patents on their time and labor-saving inventions, they have apparently not been satisfied with even the unusual degree of success to which they have attained.

Recognizing the value of united effort and active cooperation in improving the designs of up-to-date knitting machinery, in effecting large economies, and increasing the efficiecy of the service to the buyers of their product, the amalgamation of these two well-known organizations was arranged. This does not change the operation of the respective plants. The Scott & Williams plant at Philadelphia will continue as heretofore and the Geo. D. Mayo Machine Company's plant at Laconia, N. H., will run as formerly. The change is in the centralizing of the plant management as well as the selling management, both being under the supervision of Philip M. Reynolds, treasurer, and general manager of Scott & Williams, Inc., who now occupies the same positions also in the Geo. D. Mayo Machine Co., while Geo. D. Mayo has become a director of Scott & Williams, Inc. The general office is maintained at 201 Devonshire St., Boston, and the selling organizations of the two companies now handle both the Scott & Williams and the Mayo machines. Hosiery and underwear manufacturers can secure machines from this combined organization to meet any and all of their requirements.

The wisdom of this affiliation will undoubtedly be apparent to the trade, and it has every indication of giving practical demonstration in the future through improved machinery, economy of production, and efficiency of service, all of which means that the largest opportunity is opened up for the united companies to serve their customers better than ever before.

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INCREASING MERCERIZING FACILITIES

The Dragon Dye Works, Allegheny Ave. and Amber St., Philadelphia, are arranging for the installation of another mercerizing machine, foreign type, as heretofore. This addition was made necessary by the increased amount of mercerizing business, which this firm conducts on a commission basis only.

The other departments comprise dyeing of cotton, worsted and combination skeins, hosiery, winding and coning.

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POCASSET WORSTED COMPANY

Charles T. Hoye, who has for the past ten years been manager of the worsted yarn department of the National & Providence Worsted Mills, has associated himself with the Pocasset Worsted Company, and from the middle of May will have charge of its selling department.

REPEAT ORDERS FOR MONFORTS' NAPPING MACHINE

Messrs. L. H. A. Schwartz & Co., 53 State St., Boston, have lately installed, on repeat orders, A. Monforts' 36-roller ball bearing napping machine in the following mills: Pacific Mills, Tremont & Suffolk Mills, J. H. McIlroy, Son & Co., Beacon Mfg. Co., Hamilton Mills, Nashua Mfg. Co. and others.

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A BIG FAN

One of the largest fans ever made is illustrated below. It is over 32 feet high and was made by the Buffalo Forge Company. It is used in connection with the Carrier heating, ventilating and air conditioning system, supplying 25,000 cubic feet of air per hour to every employe in the new mill of the Sharpe Mfg. Co., New Bedford, Mass.

ONE OF THE LARGEST FANS EVER MADE.

In this mill particular consideration has been given to the hygienic conditions of operation. The air is washed before entering the mill, all dust, dirt and foreign matter being removed, leaving the air absolutely clean. In winter the air is heated to any desired temperature, a feature being independent regulation on each floor. Provision is also made for cooling the air, so that in the hottest days of summer the temperature throughout the mill, even in the spinning room where the machinery generates an immense amount of heat, will be from 15° to 20° cooler than is possible by ordinary window ventilation.

The volume of air that the fan handles to

achieve these results reaches the astonishing total of 20,000,000 cubic feet per hour. The conditions thus obtained are as near ideal for this kind of work as it is possible to make them.

THE HARMONY MILLS PURCHASE TURBO-HUMIDIFIERS & PARKO SYSTEM OF HOT WATER HEATING

One of the big jobs in the textile machinery trade this summer is the remodeling of the Harmony Mills of Cohoes, N. Y.

Now a Massachusetts corporation, with Albert Greene Duncan, Treasurer and Andrew Raeburn, Assistant Treasurer, every move in remodeling the equipment has been made with the care that would be expected of such an organization.

Notwithstanding the fact that both Mr. Duncan and Mr. Raeburn are trained engineers themselves, Westinghouse, Church, Kerr & Co. of New York, Engineers, and F. P. Sheldon & Sons, Consulting Engineers, are acting in concert with them.

They have recently reached a decision as to humidifying and heating. A contract has been awarded to The G. M. Parks Co. of Fitchburg, Mass., to install 1,071 Turbo-Humidifiers combined with air cleaning that usually accompanies this system: together with the Parko system of hot water heating.

As it is unusual to combine these two features in one contract, and hot water heating on such a large scale is also a novelty in textile mills, we interviewed F. W. Parks on the subject.

Among other things he said that while it is unusual that the two propositions—hot water heating and humidifying—should be considered together, but inasmuch as The G. M. Parks Co. conducts a piping business, and has for two generations, it seemed to be the logical thing to do.

While this was not the determining factor in the placing of the order, it did seem advantageous to the management to deal with one contractor on the two subjects—and so far as he knew, Mr. Parks was of the opinion that his was the only house that occupied the position of being in the position to prosecute both.

Mr. Parks said that in a recent issue of the "Fog Horn" this was touched upon to the extent that little more in addition was necessary. It is a coincidence that the article referred to described an installation in the plant of the Chicopee Mfg. Co., of which Mr. Duncan is also Treasurer; so that the placing of the present order was in a sense a further endorsement of the Turbo-Humidifier and the Parko System of Hot Water Heating. Naturally Mr. Parks felt very much pleased at the outcome.

When asked why so huge a mill should install a hot water heating system which one naturally associates with houses, Mr. Parks said it was a question of engineering entirely. For this plant, an economical low pressure steam equipment would require at least a 20-inch main pipe. The Hot Water system requires two 7-inch.

Further, a hot water system affords central control. That is, the engineer in the power station by controlling the temperature of the water in the system, controlls it for the entire plant. Of course this entails very accurate apportioning of the heating surfaces and supply pipes. The water is circulated by centrifugal pumps. Control is to be had by the speed of these as well as the temperature of the water. Textile men are beginning to appreciate the advantage of uniform conditions in temperature, realizing that uniformity in manufacturing surely results.

Mr. Parks added that every problem of this sort was a special case, and the amount of work entailed in even figuring such a work would hardly be realized. "I used to think I could do it all myself and then supervise the work when ordered. Now we have four draftsmen and a traveling superintendent of construction to attend to the details. You can readily appreciate the necessity of this when I tell you that the pipe required for this job if laid in a straight line would reach from Boston to Providence."

He added that this order of Humidifiers made an aggregate of 2,421 on the books to be installed in the near future.

These include installations for Alta Vista Cotton Mills, Alta Vista, Va.; Fort Dummer Cotton Mills, Brattleboro, Vt.; Hampton Co., Easthampton, Mass.; Canadian Cottons, Ltd., Cornwall, Canada; Southern Aseptic Co., Columbia, S. C.; Mt. Vernon-Woodberry group of The International Cotton Mills Corporation, Baltimore, Md.; Westervelt Mills, Greenville, S. C.; Harmony Mills, Cohoes, N. Y.

The G. M. Parks Co. have always been consistent users of publicity. They use the columns of the trade papers freely, and supplement it by the "Fog Horn" above mentioned. This is a little magazine they send to Textile manufacturers, describing their work more intimately and at greater length than would be possible otherwise. They tell us that the "Fog Horn" will be gladly sent to any person stating his connection in the textile trade. The last issue contained an interesting account of how a big weave shed is heated with practically no expense after the first installation.

EXCELLENT MILL PROPERTY FOR SALE

We call particular attention to a notice in this issue appearing on the "Special Want Ads" page, advertising for sale the J. Ellwood Lee mill property at Conshohocken, Pa. Because of the continued prosperity of this company and the growth of their international business, they were compelled to erect a larger factory. Through this move the old property comes into the market. Textile manufacturers interested in a new location would do well to communicate with them on the subject. The property is in the hands of Mr. George M. S. Light, Agent, 105 Fayette St., Conshohocken, Pa.

A HEATING SYSTEM

The Buffalo Forge Company, Buffalo, N. Y., is now installing in the dye house of the Farr Alpaca Company's No. 2 Mill at Holyoke, Mass., a heating system with one of their 9-foot fans and pipe coil heaters. A similar installation made for the same concern a year ago has proven very satisfactory.

TEXTILE SCHOOL GRADUATING EXERCISES

THE BRADFORD-DURFEE TEXTILE SCHOOL

The graduating exercises of the day class of this school were held on Wednesday, May 31st. President Lincoln delivered the address of welcome, after which the following program was carried out:

Class History, Thomas Francis Hinchey, '11.
Color Applied to Fabrics, Harry Jones Williams, '11.
Application of Chemistry in Textile Work, Irving Leslie Sheldon, Jr., '11.
Address—"The Factory," J. Thayer Lincoln.
Class Prophecy, William Wood Schofield, '11.
The Textile School Graduate, John William Sutcliffe, '11.
The Manufacture of Duplicate Machine Parts, Harry Hadley Howard, '11.

The medal from the National Association of Cotton Manufacturers was presented to the winner by Principal Fenwick Umpleby. Diplomas and certificates were distributed by President Lincoln.

Following is a list of the graduating class: Hugh J. Carragher, Thomas F. Hinchey, Raj K. Misra, J. A. Miller, Jr., William W. Schofield, John W. Sutcliffe, Irving L. Sheldon, Jr., Kenneth Mackenzie, Loomis C. Gray, James E. Hoar, Harry H. Howard, Harry J. Williams, Joseph M. Donovan, Edwin N. Ferrel, Augustus F. Walker, and Edward R. Simmons.

THE LOWELL TEXTILE SCHOOL

The graduating exercises of the evening class of this school were held on May 3, 1911. After an address by President Cumnock and Hon. Frederick Lawton, certificates were presented by Principal Charles H. Eames to the following graduates:

Two Years' Cotton Spinning:—Oliver Andrews, Joseph Barnes, Albert Adelard Fournier, Marcus Harriman Hartwell, James Albert Nelson, Preston Newall, John Fletcher Rogers, George Stewart, Frank Ledyard Walton.

Three Years' Worsted Spinning:—William Ernest Ballinger, Clarence Roy Perry, John Raymond Stanley.

Three Years' Textile Designing:—Bernard Daniel Ward.

Five Years' Textile and Analytical Chemistry:—Hugh Christison.

Two Years' Elementary Chemistry:—Percy Bastow, Charles Hartley Birkby, Alexander Nicholas Gakidis, Edward Miller Glennon, Alfred Leonard Gustafson, Joseph Frederick Linberg, James Brandon Manning, Phillips Brooks Marsden, Samuel Jennings Nicol, William Arthur Pedler, Orlo Foster Stearns, George Stewart.

One Year's Cotton Weaving:—Oliver Andrews, Edward James Cox, Heisayu Fujiyoshi, Marcus Harriman Hartwell, Arthur Lemire, Harold Rowlands, John Joseph Shields, Allen Reed Williams, Frederick William Wollin.

Four Years' Chemistry and Dyeing:—Forster Gordon Heaton, George Henry Smith Logan.

One Years' Dobby and Jacquard Weaving:—James Francis Burke, George Edward Hibbert.

One Year's Dobby and Jacquard Weaving:—Thomas Patrick Carty, Michael Joseph Delaney, Ernest Winslow Dodge, William Flaherty, Ross Goodwin, John Manus Handley, Charles William Hanslip, Thomas McNamara, Prescott Robert Parkin, Francis Joseph Perron, Frank James Wade, Frederick James Wright.

Three Years' Elements of Engineering:—John Albert Carpilio, Thomas Dulligan, William Hodge, William Edward Kennedy, Herbert James Willmott.

Three Years' Freehand Drawing:—Melina Lachance, Marie Emelia Racicot.

Three Years' Mechanical Drawing:—William Frank Brown, John Cochrane, George William Cote, Hubert Ronald Dean, Charles Edward Newsholme, Nathan Allen Nichols, Joseph Arthur Tennant.

Three Years' Freehand Drawing:—Melina Lawrence, Marie Emelia Racicot.

Two Years' Machine Shop Practice:—John Francis Downs, Joseph Francis Garrity, Sigfred Nelson, William Andrew Shaffer.

One Year's Woolen and Worsted Finishing:—William Edward Herrick, James Edward Robinson, Ruddach Palmer Robinson.

LOWELL TEXTILE SCHOOL, DAY CLASS

The commencement exercises of the Lowell Textile School were held on June 2d. An interesting address, which was listened to with close attention, was delivered by A. G. Cumnock, president of the school. This was followed by the reading of the following theses: Dyeing of Cotton and Wool Union Material, by Ralph K. Hubbard; The Manufacture of a Worsted Suiting, by Everett B. Rich and Joseph P. Morris. Then followed an address by Ex-Governor George H. Utter of Rhode Island, after which a thesis on The Production of a Cotton Dress Goods, by Lester B. Chisholm, was read.

The medal of the National Association of Cotton Manufacturers was then presented to the winner, also awards were made for proficiency in first, second and third year chemistry courses. The exercises concluded with the presentation of diplomas to the graduates by Principal Charles H. Eames.

THE PHILADELPHIA TEXTILE SCHOOL

The 10th annual meeting of the Board of Government of the Alumni Association of the Philadelphia Textile School was held on June 1st. After taking luncheon there was a business meeting. The following papers were presented: "The Southern States as a Field for Textile Graduates," by C. B. Finckel; "Humidity as an Aid to Textile Manufacture," by E. D. Hague; "The Textile School in its Relation to the Buyer of Textiles," by W. B. Kirby; "Requirements of the Clothing Manufacturers," by H. R. Eisner.

The commencement exercises of the school were held at the Broad Street Theater in the evening. An interesting address entitled "The Man Who Knows How" was delivered by Charles Heber Clark. On June 2d there was the 8th annual cruise of the Alumni Association. The City of Philadelphia placed the police boat "Ashbridge" at the disposal of the association, which enabled

the cruise to be extended. The annual banquet was held at the Hotel Majestic on June 2d. Addresses were made by Mayor Reyburn, Governor Tener, Joseph R. Grundy, Marcus M. Marks, Senator Heyburn of Idaho, and John P. Wood, president of the National Association of Wool and Worsted Manufacturers.

The diplomas, prizes and certificates awarded were as follows:

DIPLOMAS AWARDED

Regular Textile Course:—Eldon F. Brewster, Oresimo Gonzalez, Thomas M. James, Shuji Kawamuro, Frederick P. Keller, Cyril J. Morrissey, Charles A. Ramsperger, William L. Rebert, Ramon Sosa, Meyer Sperber, Bertram A Stroock, Ralph O. Swalm, Algernon T. Weaver.

Chemistry, Dyeing and Printing:—Thomas Forsyth, Louis P. Masteroff, Gustav Muller, Sumner P. Winslow.

PRIZES AWARDED

National Association of Cotton Manufacturers' medal for general excellence, third year, Frederick Paterson Keller.

Henry Friedberger Memorial Prize—$10 to student ranking second in general excellence, third year, Meyer Sperber.

Textile World Record Gold Medal for general excellence and thesis, chemistry, dyeing and printing course, third year, Thomas Forsyth.

Associate Committee of Women's Prizes—$10 for best Jacquard design with executed fabric, third year, Eldon F. Brewster.

Miss Clyde Prize—$10 for best Jacquard design with executed fabric, second year, Hibbert H. Dancy.

John G. Carruth Prize—$10 for highest rating in the wool course, second year, Hubert C. Hodek.

Krout & Fite Mfg. Co. Prize—$10 for highest rating in cotton course, second year, Edward J. Ashe.

Mrs. Joseph F. Sinnott Prize—$10 for highest rating in the chemistry, dyeing and printing course, first year, Ernest F. Apeldorn, Jr.

Delta Phi Psi Fraternity Prize—$10 for general excellence in weave formation and fabric analysis, first year, Thomas F. Dooley.

Delta Kappa Phi Fraternity Prize—$10 for best executed work on the hand harness loom, first year, Felix A. Kuenzel.

Phi Psi Fraternity Prize—$10 for best executed work in color harmony and design, first year, Willard C. French.

Elizabeth C. Roberts Prize—$10 for best specially designed and woven Jacquard fabric, Charles Heck.

Prize scholarships for the school year 1910-1911—Frank A. Roth, first year regular course; Carl T. Tourtellot, second year regular course; Arnott R. Broom, second year chemistry and dyeing course; John Naab, evening class; Arthur C. Broughton, evening class.

CERTIFICATES AWARDED

Full Course, Day Classes: Cotton Course—Edward J. Ashe, Joseph L. Bridger. Silk Course—Sidney C. Groeschel, George A. Handwerk, Charles Heck, Frederick J. Salathe. Wool Course—George E. Gillespie, Hubert C. Hodek. Yarn Manufacture—F. E. M. Schenke. Cotton Yarn Manufacture—F. L. Landerberger.

Partial Course, Day Classes: Henry Anner, Jr., Donald deP. Crawford, Hibbert H. Dancy, Frank L. Giese, Alan P. P. Hoblitzell, Alvin Kingsbacher, Carl Nagel, Frank B. Shuler, James A. Sinex, Harry R. Stephenson, John H. Spencer, Jr., John A. Thackrah, Jr., Carl T. Tourtellot. Two Years' Chemistry, Dyeing and Printing—Arnott R. Broom, John R. Watson.

Full Course, Evening Classes: Regular Textile Course (Three Years)—William Fraatz, Jr. Chemistry Course (Three Years)—J. Newlin Brown, Charles Miller, Harold S. Roberts. Chemistry and Dyeing Course (Three Years)—Walter C. Belz, Warren B. Thompson.

Partial Course, Evening Classes: Weave Formation (Three Years)—William A. Burke. Fabric Analysis and Calculations (Three Years)—William A. Burke. Jacquard Design (Two Years)—Walter Capper, Robert T. Lawson, Harry Little. Woolen Yarn Manufacture (Two Years)—William H. Arensmeyer, Charles J. Brady, John J. Hosey, John Peacock. Worsted Yarn Manufacture (One Year)—Wm. H. Arensmeyer, Arthur C. Broughton, John L. Carr, Frank King, Fred. H. Longbottom, Charles P. Lower, John H. Prifold, Charles Schilling, Charles F. Sloan, Jr., John E. Normington.

American Cotton Manufacturers' Meeting

(Continued from page 309.)

At the conclusion of the President's address, W. A. Irwin, Chairman of the Board of Governors, presented to Mr. Cooper on behalf of the Association a gold medal in the form of a watch fob, showing the coat of arms of the Association. He spoke of Mr. Cooper's valuable services and the good work he had done for the Association. Mr. Cooper responded appropriately, and spoke of the pleasure it gave him to see so many present, and especially so many from New England, saying that the associations present represented a vast aggregation of capital and an industry upon which thousands of persons were dependent.

Mr. Cooper then introduced Franklin W. Hobbs, President of the National Association of Cotton Manufacturers.

It is a great pleasure and privilege to be here today and to bring to you the congratulations and best wishes of the National Association of Cotton Manufacturers. I am happy to state that these

two great organizations are working together in perfect harmony along the same general lines. I personally do not believe that at present, at any rate, it is wise to think of consolidation, for the organizations are too big and too diversified in local interests to make amalgamation advisable. On the other hand, I believe that annual conferences and meetings of the officers of the two associations will certainly bring about good results and continue to cement the present friendly relations, and furthermore enable us to work together to the mutual advantage of our industry. As you know, a conference of this nature was held in Washington on Feb. 2, 1911, by request of the National Association of Cotton Manufacturers and many important matters were discussed, and I am certain good will result. As I have said before, I feel that while such conferences are of great value, they cannot accomplish their real object unless afterwards we put into action the matters advocated and approved. It is easier to get votes for resolutions than it is to get the resolutions carried out in actual business life. Why should this be? Does it not reflect on our good sense and indicate indifference to real progress if it requires much effort on our part to attain it?

As a result of the tremendous development of cotton manufacture in the cotton growing states, nearly all of which has taken place in the last twenty years, those states now have about 40 per centum of the spindle and use about 50 per centum of the cotton consumed in the country. No man dare predict what the developments will be, North and South, in the next twenty years.

It is clear, I think, that in the textile business we must all stand or fall together and that legislation or business conditions that affect one section must in the end affect all sections alike. There was a time possibly when it was true that the South made mostly coarse goods and the North fine, but that distinction no longer exists and latitude now has little to do with the character of the goods. This will prove to be the case more and more as a result of the natural development of the industry. So I say that whatever affects one of us, affects all of us, for our interests are identical.

I welcome, therefore, this opportunity to be here today to meet you and to have a chance to exchange views, for by so doing we shall be drawn closer together and appreciate more clearly the real interdependence of all parts of our country and the unity of our interests. May the time soon come when it shall be a fact that we shall stand unitedly together on all matters relating to our industry and in the words of Henry Clay there shall be "no North, no South, no East, no West," and our sole endeavor shall be to work together for the prosperity and success, not only of cotton manufacturing, but of everything in our common country.

The meeting then settled down to the regular presentation and discussion of papers, the first on the list being that of Dr. Reid, missionary to China.

SUGGESTIONS AS TO THE INCREASE OF OUR PIECE GOODS TRADE IN CHINA

By REV. DR. GILBERT REID,
Director of the International Institute of China

As a professional man, I acknowledge my incapacity to offer any suggestion on matters of trade. It is as a resident in China for nearly thirty years, and as one who has studied the relations of foreign commerce to Chinese conditions, that I may be allowed to offer a few suggestions. I recognize that suggestions are subject to modification by those who are more experienced. I take this opportunity of addressing the American Cotton Manufacturers' Association, because I realize that I am familiar with existing Chinese conditions, with the wishes and sentiments of the progressive and enterprising Chinese, and with the new policy of administration which is being worked out with considerable success under the new form of constitutional government.

I will first refer to some of the new conditions in the national life of the Chinese, especially in their bearings on commercial interests.

It is first important that we realize the increased competition that prevails in all branches of business in the Empire of China. Originally, there were two chief competitors in both the import and export trade of China, the British merchant and the American merchant. Today besides the growing competition between the business men of these two countries, there exists competition with the Germans, the Japanese, the French, the Russians, and in fact nearly all the countries of Europe. Originally, there was room for the competition of British and American merchants. Today there does not seem to be room for all of these competitors in their efforts to extend trade with China. Difficulties to be met in the matter of competition can only be overcome by enlarged field of commercial enterprise. International competition is a problem that needs to be carefully studied and considered.

Therefore, there arises the third condition of increased trade with China, and that is, the importance of American commercial men exhibiting a larger degree of generosity in their attitude to China. The altruistic side of commerce is the side which will impress the Chinese mind, win their favor, and secure an open door for our business enterprises. Our competitors, the German merchants, have already grasped this idea. In fact, the whole policy of the German Government has altered within the last few years. Formerly, we were all impressed with the methods of force, with the mailed fist idea, which characterized the German Government in its treatment of China. Lately they have reversed these methods and adopted a policy of conciliation, adaptation, friendliness and generosity. Funds have been provided by the Imperial Government of the German Empire, by different State Governments, by the great banks in Berlin, and by the merchants in Hamburg, for establishing various technical schools for the instruction of Chinese youths, and for the establishment of a large medical school with a hospital in the City of Shanghai. It is true that benevolence not only is an obligation, but it is an important part of successful business enterprise. Not only

is honesty the best policy, but generosity is the best policy.

A fourth aspect of the general situation in China, illustrating the changed conditions which have taken place of late years, is the necessity of adopting cooperation, if our business relations with China are to improve. Such cooperation is the outcome of the spirit of generosity. In former years we were accustomed to the gun-boat policy, and to the threats and interference of other governments in the affairs of China. Foreign capital was introduced, if the Chinese Government should consent to a concession. Today the concessionaire is not as welcome as the advocate of friendly cooperation, wherein foreign capital and Chinese capital, foreign experience and Chinese experience, foreign enterprise and Chinese enterprise, may be combined. This means the formation of Joint Stock Companies, and in a lesser degree in some kind of friendly agreement whereby both the Chinese and foreigners may be benefited. One of our leading merchants on the Pacific Coast, who has several steamers of his own sailing to and fro between China and this country, has made one arrangement with merchants in Shanghai to purchase Oregon pine which may be carried as cargo to China. Another agreement has been made, whereby 72,000 tons of pig iron shall be brought back as cargo from China and sold to a steel foundry in Seattle. Such cooperation is of mutual advantage. By its application our whole scheme of an International Institute has succeeded. The principle needs to be recognized in all attempts at introducing American goods into China, especially our American piece goods.

Thus the general aspect of international competition must be met by promoting the development of China; and the development of China necessitates the exemplification of the spirit of generosity; and the spirit of generosity appreciates the suitability of the method of cooperation.

Now as to the particular aspects of our piece goods trade with China, especially as conducted by the cotton manufacturers of our Southern States. The suggestions I beg to offer are the result of several years of personal observation. I speak as a friendly ousider, and not as a pracical worker from the inside.

The first suggestion is concerning the packing of our goods. I have no special criticism to offer, for I believe that, comparatively speaking, there is no special fault with the packing of cotton goods by our American merchants and manufacturers. Still the exhortation may not be out of place. Caution must be taken in the packing of goods, if they are intended for the far-away interior cities of China. It is one thing for Japan to send her goods across the Japan Sea into Manchuria, and another thing for our manufacturers to send their goods from our Southern States to the Atlantic Coast, and then around the Cape, or, later, through the Panama to the Ports of China, and than transshipped by river steamers or canal boats or coasting steamers to other trade centers, and then transported by carts, wheelbarrows, or pack-animals hundreds or thousands of miles to the large communities of inland China.

A second suggestion is concerning the quality of our piece goods. As a rule the quality of our goods ranks as high as the quality of goods offered by the manufacturers in other countries. I would not urge that we cease to produce a high-grade class of goods; but that we also produce a lower grade class of goods, such as may be purcased by the vast majority of the Chinese people. Our best goods will be purchased by the wealthy Chinese. Cheaper goods of a coarser grade will be purchased by the ordinary Chinese, in the present undeveloped condition of the country.

My fifth suggestion, which I regard as most important, is that we adopt the method of direct agencies rather than the method of indirect agencies. Here, too, the Standard Oil Company and the Tobacco Company have shown their sagacity and won success. One method is for our manufacturers to send their goods to certain business houses in New York, who in turn will sell their goods to firms engaged in China trade, who on their part will undertake to ship the goods to Shanghai and by negotiation with the Chinese go-between or compradore sell the goods to Chinese firms doing business in piece goods, who in turn will take the goods thus purchased and sell them to agents of Chinese firms from other cities, and who finally will sell the goods direct to the Chinese people. Another method is for our cotton manufacturers to send their goods direct to their own headquarters in Shanghai or any other important treaty port in China, and then by a large, well-trained staff of American agents and Chinese agents undertake to sell their goods directly to the people in all parts of China. The American agents could reside at any of the treaty ports and could travel as supervising agents through all of the provinces of China. On the principle of cooperation, first-class Chinese shops in the different cities might be induced to act as agents for our goods thus brought to their attention by our own agents, versed in the Chinese language and familiar with Chinese customs, or by trustworthy Chinese agents who will seek with enthusiasm to find the very best of their own countrymen to join forces with a well-known and aggressive American Company. This latter method means economy of energy. The more direct the agency, the greater the chance for remuneration. A few years ago the Tobacco Company started in Shanghai with only a few rooms and with little trade. Today they have a large business house, with active workers, in the City of Shanghai, and trade introduced into every city, and almost every village of China. Various grades of American cigarettes, and also of cigarettes made in local factories, have caught the fancy of the Chinese people, and through special inducements have found a ready market. I am confident that the same method would mean success in the introduction into China of the piece goods manufactured in our Southern mills.

To sum up in a practical way these suggestions, I beg leave to offer the following general outline of a plan of operations. Let our Southern manufacturers combine in one new corporation for the special purpose of selling to China their various grades of piece goods. This corporation could establish in Charleston a large storehouse for receiving goods from the different mills, and for transshipment to China. This corporation, in view of the opening of the Panama within a few years, could have their own steamers sailing direct to the leading ports of China. A large establishment

could be started in Shanghai, either as a new firm, or in cooperation with some existing firm. This establishment would send their agents into all parts of China, carrying their goods into new markets, and dealing directly with Chinese shop keepers in all the large cities. Money would be required in large amounts to carry out these different stages in the new attempt to promote this branch of trade in China.

At the conclusion of Mr. Reid's paper, there was more or less discussion and criticism of his suggestions. Howard Ayres, Secretary of the Cotton Goods Association of New York City, who had been in the China business for thirty years, believed that this line of business could not be worked up in the manner suggested by Mr. Reid; that there was no sentiment about it, but a pure business proposition. If the American merchants and exporters were wiliing to sell goods at a loss for a number of years to introduce their fabrics it might be possible to gradually work up trade along the suggested lines, but if they were going to meet competition and get returns commensurate with the cost of doing business, he did not believe there could be much improvement over present methods. Mr. Ayres pointed out the difficulties of the currency question in doing business with China. One reason for the falling off in our China trade in the last few years has been the great depreciation in the price of silver and the debasement of the copper coin, so that the purchasing power of the Chinese has been tremendously reduced. Mr. Ayres was hopeful that eventually the China trade would return to American manufacturers. In reply to a question asked by Stuart W. Cramer, Mr. Ayres stated that the cost of doing export business between New York and the cost of doing business to the ultimate consumer after the goods reach China was also about 1 1/2 per cent., making a total charge of about 3 per cent. to be added to the cost of the goods in New York.

At the conclusion of the discussion, Theodore H. Price extended an invitation to those present to witness the demonstration of the Price-Campbell Cotton Picker. Mr. Jennings, who prepared the following report on the cotton picker at the request of the Association, was not present to deliver it in person and his paper was printed for distribution.

THE PRICE-CAMPBELL COTTON PICKER FROM PERSONAL OBSERVATION

BY H. B. JENNINGS

Last October Mr. Theodore H. Price, of New York, invited your Association to appoint someone from the membership of the Association to go with himself and a party of ladies and gentlemen from New York and New England to Texas and Oklahoma, for the purpose of witnessing field and shop demonstrations of the Price-Campbell cotton picking machine. Your honorable Secretary sent me the appointment, which was accepted.

I went to St. Louis, there joining the party at the Terminal Hotel, Saturday afternoon, October the 15th. We left St. Louis that evening about eight o'clock, stopping the next night at Mesquite, Texas, a small town about seven miles from Dallas. The following morning the party was driven out to the plantation of Mr. Schuyler B. Marshall, where we saw the first demonstration of the machine. A large crowd had assembled; the machine was promptly put in operation, moving down and directly over the cotton row, being guided by a man sitting on a comfortable seat above the fore part of the machine; it moved along about as fast as the average man walks. The crowd followed the machine closely up and down the rows of cotton, and I noted very closely the operation of the machine and the effects upon the growing plants. At the time of the demonstration the plant had not been touched by frost, was very green, and contained a good supply of open cotton. I had gone on this trip right reluctantly, feeling that I would of necessity have to make a report which would be condemnatory of the machine, as I had always believed this accomplishment one of the mechanical impossibilities. The first operation of the machine was an "eye-opener;" it did the work far better than I had expected, the cotton being picked without visible injury to the plant; not even were the open blossoms damaged; I did not see a bloom or a green boll fall to the ground. The open cotton was nearly entirely cleaned from the stalk by the machine, and at the rate of about five hundred pounds per hour, with only one man operating it.

The machine has the appearance of a large automobile, and is driven by a 30 h. p. gasoline motor, which seemed to supply ample power for the purpose intended. The cotton picker, as stated before, moves down directly over the plant, and has in front a v-shaped guide, which slightly compresses the plant as it passes along, bringing the whole within reach of the little steel fingers; these fingers are the most ingenious part of the machine; there are about three hundred of these on each side of the center line of the picker; they are about eight to ten inches long, by about one-fourth inch diameter at the hub end, tapering to a point about one-eighth inch diameter; they revolve very rapidly, and have a faculty of moving backward out of the branches of the plant, at the same speed as the machine moves forward; this largely explains how these numerous steel fingers can thoroughly search every inch of space within the plant form without tearing and otherwise damaging the plant itself. The finger has a row of teeth, very much the same as saw teeth, running from end to end, but covering laterally only one-fifth of the surface: this finger, turning to the right, engages any lint which it comes in contact with, and

releases it when it reverses its motion on the back stroke; thus released, the cotton is delivered onto a belt conveyor, there being one on each side of the machine; these conveyors take it to a large canvass basket at the rear of the machine, a basket being on both right and left-hand sides; the two sides of the machine are identical in all respects, which makes it unnecessary that the steel fingers should penetrate more than half way through the plant form.

We saw the cotton picked on Mr. Marshall's plantation weighed, and loaded in several wagons; this was marked for identification by the members of our party, and the drivers were directed to go to the large Murray Ginning Company plant at Dallas. Our car was soon attached to a passing train, which took us to Dallas; we went immediately to the gin, and about the same time the loaded wagons arrived; the cotton was identified by our party, and was then driven under a gin's suction conveyor, and delivered to a cleaning machine, thence to the gins and to the press; we witnessed all the details of converting the cotton from seed cotton to bale ready for market. When the cotton was baled and rolled on the platform, we took samples from all four sides; the consensus of opinion was that the cotton classed Strict Middling (New York Classification).

The next demonstration was at the Dallas Fair Grounds; the ground encircled by the race track was planted in cotton, which was ready for picking; here we saw two of the Price-Campbell cotton picking machines in active operation. So much interest was manifested in these machines, the field was enclosed by wire fence, and gatekeepers employed to keep back the crowds. Here I saw another mechanical picker in operation; it was horse-drawn, and worthy of but passing notice; the horses appeared overloaded, and a great deal of cotton was left on the ground as the machine passed; the plant was also injured considerably. I did not learn the name of the machine or its promoters.

This demonstration at the Dallas Fair Grounds was an impressive sight; many native farmers had gathered there, and a good many were admitted to the cotton field, in order that they might see the operation of the machine at closer range; I talked with a number of them, and everyone pronounced the picker a success; the only criticism I heard was the amount of green leaf which was picked along with the cotton; this was, for the most part, eliminated by one process of cleaning at the gin. I talked to both Mr. Price and Mr. Campbell concerning this feature, and was informed that they had perfected an attachment to the picker which would take out this leaf as the cotton was being picked; they had not yet applied this attachment. If this trouble is overcome, the machine is an asset with which cotton producers throughout the South will of necessity have to reckon in the future. With these mechanical cotton pickers in universal use, there will be a very great increase in acreage of cotton.

After spending a few days in Dallas, our party went to Dalworth, Texas, where we saw another of the Price-Campbell cotton pickers in operation; this demonstration was not unlike those we saw at Mesquite and Dallas; the machine operated without a hitch, picking the cotton at the rate of about 500 pounds per hour.

We then went to Vernon, Texas, in the edge of the Panhandle district; here we were to have seen another of the machines in operation, but were disappointed, a heavy rain falling all day; from this place we went to Oklahoma, and were to have seen a demonstration at Oklahoma City, but were again disappointed by rain. I left the party at that place.

Your representative was treated with every conceivable courtesy by Messrs. Price and Campbell, and wishes on this occasion to again express his appreciation, and to declare his faith in the machine which these two gentlemen have developed.

The meeting then adjourned. A photograph of the delegates was taken on the steps of the church near by, after which the members witnessed the demonstration of the cotton picker, which performed its work in the satisfactory manner previously described in this magazine.

The afternoon session on Thursday was opened by Harrington Emerson, Efficiency Engineer.

EFFICIENCY AND SCIENTIFIC MANAGEMENT

BY HARRINGTON EMERSON

There is in Germany a saying a thousand years old to the effect that a tailor is a radical and a barber a conservative. What has this to do with efficiency? Recently a Western educator of great insight and ability went through a large Eastern textile plant. As he finished his rapid inspection he said to the president, "Here is one department in which the employes are troublesome, kickers at the mill; disturbers of the peace in the village, brawlers in their home life." The president said, "This is true, but how do you know it?" The answer was that the conditions surrounding the employes necessarily produced these results. Conditions that produce employes of this kind are not efficient conditions. The tailor is a radical because the monotonous repetitive work of sewing and inaction, of sitting cross-legged, instead of soothing, upsets the mind, which has no opportunity for expression, and which has to assert individuality when the hours of labor are done. The active barber, moving around, sees twenty new individuals a day; the barber whose work is not the same for two successive minutes,works off his excess personality, and when night comes he stands for conservatism. There are three ways to secure efficiency of quality in plant life; to plant good seed, to graft good stock and, in either case, to furnish best conditions. Recently in a grocery store I looked at two boxes of apples. In one, every apple, carefully placed, was large, red and perfect, not a flaw of any kind, and the box of a size to fit the apples. In the other box were apples unassorted as to color or size, speckled, worm-eaten, tainted, and many rotten, mixed higgledy-piggledy. The perfect apples were from the State of Washington, where apples are grown and

shipped in the new way; the other apples were from the State of New York, where apples are still grown and shipped in the old way.

Efficiency consists, not in knowing at sight the fine apple, but in knowing and governing every condition from selecting and planting of seed to size of packing-box and method of refrigerator shipment. Is it not a disgrace that the fruit markets of the Atlantic coast, where fruit has been raised for two hundred years, should be supplied with fruit from the north Pacific coast?

There is just as large a field for improvement in textiles in New England as in apples. What is the trouble with American cotton mills? The same trouble that exists with nearly every other American industry. It is over-equipped and underdeveloped. It has been so busy marketing natural products in semi-manufactured form that the refinements of manufacture have been neglected.

Steel billets are exported to England, only to a small extent iron and steel products; lumber is exported, not furniture; cotton is exported, not cloth; food products are exported, not the brain and skilled handwork of men whom this food might have fed. Recently I went at an interval of a week into two textile mills, one North, one South. The latter was owned and controlled by Americans of the highest type. They had built a monumental mill, equipped it with the best modern machinery and with operators, all native Americans, everybody with highest skill and intelligence, but it was running at a loss. They had gone at the problem from a main-strength point of view. The product was unbleached cotton cloth of coarse texture and even as to this they worked to specialize on one grade so as to eliminate any need for thought, imagination or enthusiasm. The raw cotton had cost about fourteen cents. The labor cost was scarcely more than one-third of the material cost, and power was at less cost than I have ever known steam power to be provided.

The other mill was in the country, twelve miles from the railroad station, a cheap barn of a structure, owned and operated by foreigners from a remote corner of Europe. They paid seven to ten cents for their material, had very great technical difficulties of manufacture to content with, but they sold their product at a dollar a pound and were behind with their orders. They were not over-equipped, they were not converting an abundant native product into a semi-finished sheeting by perfected machinery and sundry operations. They were making a foreign product, spinning it in an under-equipped mill with unperfected machinery and a few foreign operators.

The Americans used money, the foreigners used brains.

During the next few years in other branches of business besides cotton we shall hear of over-production. American mills today, steel, lumber, cotton, paper, railroads have equipments sufficient for twice the business.

There are just two remedies possible: (1) To grow to the capacity of the equipment; (2) To become one of the efficient survivors.

It would take a generation to grow up to the capacity of equipment, so this offers no consolation. The other method will act automatically. There is going to be a squeezing-out process, and while efficiency may not save every unfortunate plant, it is by far the biggest element in sight in eliminating those losses, which make the difference between a credit and a debit balance.

Efficiency does not consist of any particular stunt or device; it consists in so organizing as to (1) Make available all the knowledge in the universe that may be available for each minute item of manufacture. (2) Ascertaining exactly what present conditions are. (3) Setting up ideals that ought to be attained. (4) Everlastingly applying the principles of efficiency until the ideals are attained.

Every good manager instinctively applies many of the principles of efficiency; however, he not only does not apply all of them to the full extent that he ought, but he puts forth many efforts that are not only not in accord with efficiency principles, but in conflict with them, so the end results is a very large amount of expended labor and effort, and small results, very much like the New York State apple proposition.

Efficiency principles, if properly applied and exclusively applied, do for a textile plant what horticultural principles do for apples when properly and exclusively applied. The principles rest on common sense. Actual practice rests largely on prediction.

Common sense is the foundation for all the principles of efficiency. Any criticism of scientific management which is itself not based on common sense is discredited, any lack of common sense in any plan of scientific management is necessarily to be blamed, since every one of the principles must be applied with common sense.

It is well that there should be criticism, even ignorant and foolish criticism; it does no harm to have a child point out a road as leading to a broken bridge, a road on which no one is traveling and which no one is intending to take. The child flatters himself that he is uttering a needed warning. Some criticisms are, however, more than childish.

A recent critic taking up the assertion of railroad experts and efficiency engineers that the coal bills for firing locomotives are higher than they could be, a proposition no one who knows anything about the subject will deny, puts up the following objections: If the fireman and engineer are paying attention to coal consumption they will run past a signal and kill a dozen people.

Coal costs depend on ten or twelve items in dependent sequence stretching all the way from mine to ash pit. Two and only two are up to the combined efforts of engineer and fireman. The engineer can contribute to the saving by easing on the up grades, by shutting off steam on the down grades, by starting and stopping more carefully; the fireman contributes by making less smoke, by having the pop valve blow off less often, by bringing the locomotive in with coal burnt out instead of a furnace full.

On actual test as to coal consumption on road and in roundhouse, a reduction of two-thirds was made in certain checked runs on the Erie Railroad. If less coal is burned the fireman has more time to watch signals if this be any part of his

duty. If there is less steam, less smoke, the engineer can see signals better if he is watching grades and curves, starts and stops. He must watch all signals more closely. It is the careful engineer on to his job as to coal who will also be on it as to signals. It is the careless engineer, who pays scant attention to such details as coal who will sleepily run by signals. It has been contended that there has always been an efficiency engineering. This is true. Laying burnt bricks is efficiency engineering, an improvement of mud walls, but until the last five years bricks were laid as in the days of Pharaoh, under whom the first recorded strike against piece rates occurred, the strike inaugurated because the rate was cut.

One man who studied during five years has shown that with less effort three to four times as many bricks could be laid.

Steel tools have been used since the days of Tubal Cain, before the flood, with very little improvement. About fifteen years ago Taylor and White began some xperiments which resulted in the development of high-speed steels, and these steels are able to cut many times more than the old steels, in certain cases thirty times as much.

These discoveries and developments were the direct results of the application of the principles of scientific management.

Chemistry is as old as the universe, the applied chemistry of cooking, of dyeing, of preserving, of canning is practiced even by savages, but the old methods are still practiced, but modern knowledge has told us why in addition to food, it has also immensely extended and refined all applications. The sneer, therefore, that scientific management is not new is the sneer of narrow ignorance.

The average American is justly proud of the Naval victories at Manila and Santiago. He does not know that at the latter fight out of 9,000 shots fired at a distance of a mile and a half only 125 took effect, and among them not a single twelve-inch shell.

To the average American the Navy is the same today as thirteen years ago, but scientific management has come into the Navy, the principles of efficiency have been applied and today at twice the Santiago distance there is not a battleship that could not hit with half the shots a much smaller target than the Spanish man-of-war, the shots being fired in one-quarter the time. This means that each individual battleship is several hundred times as effective as a decade ago. This has been brought about by bringing all the available information and helps in the world to bear, practicing and practicing until high result is obtained, thus making each to live in fullest measure up to the responsibility imposed on him.

Another current criticism of inexperience and ignorance is that methods of scientific management can only be applied to oft-repeated work, localized and centralized as to control. It is better to know less than to know so much that is not so. We who know can tell the theoretical critic that repeated localized work ought easily to be well managed and that in fact in some work of that kind most losses have been eliminated. It is because it is harder to apply even elementary control that unrepeated, unlocalized work is so terribly inefficient. Let us assume that a repeated localized operation shows a recorded efficiency of 95 per cent., that the similar unlocalized, unrepeated operation shows an efficiency of 10 per cent. Which is the more sensible and more profitable task, to bring the repeated work up to 100 per cent. efficiency or to bring the unrepeated operation up to 60 per cent.? In one case the improvement is 5 per cent., in the other 500 per cent., and when precisely this criticism was made by a master mechanic in a great textile mill as to his repair work, I showed him the first worker and mentioned that his efficiency was only 1 1/4 per cent., not because it was an unrepeated job, but because the worker overran the stroke, because the shaper was running slow, because they were using a diamond-pointed carbon tool, because four cuts were taken instead of two, because in part the elementary principles of scientific management had not been applied.

Nowhere is work more scattered than on a great railroad. The fast train from New York to Chicago runs through six States and over two different railroad systems, yet its time schedule is scientifically adhered to from start to finish. On another railroad of 10,000 miles, located in 12 different States and Territories, with its repair work in more than 20 shops, large and small, employes of all nationalities and kinds, a little scientific management reduced the expenses for maintenance of shop machinery and tools from $500,000 to $250,000, in spite of an increase of 50 per cent. in business, and this result was predicted, the methods of realization planned before it was undertaken.

Scientific management is not an edict that has gone out from Congress. Nobody in control who is content with his old methods and his slow progress will be forced to change his ways. He can fall behind and perish if he so elects, or he can continue to exist because of special advantages; but he who without investigation or experience says there is nothing to it is worse than the ostrich with his head in the sand.

Mr. Emerson did not follow his paper closely, but enlarged on the features of efficiency and scientific management, correcting some of the false arguments that have been raised against it, and particularly pointing out the fact that it is in those operations which are not many times repeated that some of the greatest percentages of saving are effected by efficiency management. Mr. Emerson cited numerous illustrations from his practice and was particular to emphasize the point that the efficiency engineer did not claim nor did not need to understand the technical details of any particular branch of business in order to render valuable service. He compared the work of the engineer to an attorney who is used to advising in legal matters pertaining to all sorts of business.

Mr. Emerson was asked various questions by Messrs. Arthur H. Lowe, Louis W. Parker and Franklin W. Hobbs. Mr. Parker asked a particularly interesting question as to whether or not an efficiency expert would be able to give advice in the matter of waste, so that a manufacturer could determine whether or not the particular grade of cotton which he was using for a certain line of goods was more or less efficient as regards waste, in comparison to cost, than another grade, and Mr. Emerson thought that an efficiency engineer ought to be able to do this. Mr. Hobbs asked the speaker why it was that the efficiency engineer was able to provide men who could detect waste and inefficiency methods better than the manufacturer himself whose whole effort and experience were in this direction. Mr. Emerson's answer was to the effect that the efficiency engineer acted in an advisory capacity and from an outside point of view, based not so much on detailed technical problems as upon efficiency methods common to many lines of manufacture and methods.

The report of the Committee on Excess Tare and Cotton Warehousing was then made, as follows:

REPORT OF COMMITTEE ON EXCESS TARE AND COTTON WAREHOUSING, JOHN A. LAW, CHAIRMAN

Owing in part to the negligence of the chairman in not outlining work for the individual members of the committee and by reason also of the fact—recognized, no doubt, by this body—that all manufacturers have, during the past year had unusual cares and duties for which they felt direct responsibility, your committee admits that it has not pressed as vigorously as it wished the two important subjects placed in its care.

The chairman, however, has given time personally to the following three subjects which we feel are of interest to the association and the further cooperation of the committee should it be continued:

First—Rolled Steel ties: Some correspondence has been conducted with manufacturers of rolled steel ties, the claim being made that a steel tie, somewhat heavier in gauge than that now used in baling cotton cloths, and say three-quarters of an inch wide, would hold a bale of cotton and would weigh, with the buckle, which would also be lighter, 65 to 75 per cent. less than the ordinary iron cotton tie now in use.

The steel tie having, it is claimed, a tensile strength greater by 50 per cent. than the iron tie of same width and gauge, three pounds of steel ties, it is estimated, would perform the services now requiring nine to ten pounds of iron bands. The important argument is also made that the cost to the farmer or ginner would be at least no greater.

In view of the lax tension in the case of bales of soft cotton, a different buckle will doubtless be used in lieu of that now used in baling cotton goods. It would perhaps also be necessary to use galvanized ties to prevent discoloration from rust where cotton is exposed to the elements. If the estimated cost of 13 cents a bale by use of the black steel ties, or 15 cents a bale by using galvanized ties, is correct, and an article of greater tensile strength is thus obtained, there should certainly be no objection on the part of farmers or ginners in adopting this improved product other than a desire, by the use of a heavier material, to make the difference between the cost of that material and the present high price of cotton. Against this it is clearly the duty of the buyer of cotton to protect himself.

Second—Patent Bagging and Tie Plant: A group of North and South Carolina mills have united in the purchase of patent rights for repairing both bagging and ties, taking over, along with such rights, a plant in Norfolk for the making of bagging out of the bagging scraps and waste cotton. An additional plant has been established at Spartanburg, the bagging and ties, just as taken from the bales, being there assembled by the mills for resorting and repairing.

The patent bagging process covers the cutting out of the warp strands, which have been severed in the sampling of the cotton, and then tying together by hand the ends of the filling strands, thus bringing the unsevered warp strands together and avoiding the necessity for patching. The tie patent is a simple process of forming a bump on each side of the tie as it is being spliced, this bump or obtrusion preventing the rivet or spliced ends creating an obstruction in passing through the press. The pressing up of this lump or obtrusion is done simultaneously with the punching and riveting of the tie.

While it is hoped that this enterprise will assist in providing for the mills a better market for their bagging and ties, an equally, if not more, important object in view is to effect a discontinuance of the sale to nearby ginners of heavily patched patterns to be repurchased by the mills at the present high-cotton price.

An important factor in the success of the idea will also be the very proper refusal of the mills to buy local cotton covered with patched bagging. Arguments against a continuance of the present method of selling at 1 per cent. and rebuying at say 15 to 16 cents should not, it would seem, have to be pointed out to men of even ordinary business ability, much less to those in charge of large manufacturing enterprises.

Third—Gin Compress: In the paper which perhaps suggested the appointment of this committee, the prediction was made that sooner or later the process of compressing in transit with its many disadvantages, such as delays, occasional fraudulent packing and frequent excess covering, would be abandoned. The impropriety, not to say the danger, of giving to transportation companies the

right to so radically change the form of any article while in transit, its actual identity being in many cases practically obliterated, would seem self-evident.

Your committee is informed that perhaps by next week there will be ready for actual test and demonstration a hydraulic gin compress which, it is claimed, can be used in compressing the lint just as taken from the gin, or gently reducing the size of the ordinary plantation bale, the compressed bale in either case being 24 by 24 by 48 inches in size, as against the ordinary farm soft cotton bale of 58 by 27 by 45 inches and the present steam compress bale of 62 by 30 by 20 inches. The actual difference represented by these figures can best be grasped by the simple statement that, if thus compressed, 100 bales of cotton, or the amount usually covered under one contract, could be shipped in one 34-foot car, with seals unbroken between shipping point and destination.

Your committee, of course, is not in position to substantiate the claims above outlined or as yet to express an opinion as to the practicability of this particular compress. Should it, however, prove practicable and its actual workings accomplish the estimated saving in reduction of covering and the space required in warehousing and transporting, it cannot but be a material factor in remedying some of the evils against which cotton growers, ginners, merchants, warehousemen, transportation companies, manufacturers and bankers are now contending. Should this particular device not prove practicable, our interests in the ultimate obtaining of results similar to those claimed for it should not abate. The perfection of the compress (whether now in process of development or yet to be invented) which does accomplish such results, will well deserve our interest and its general use our cooperation.

Respectfully submitted,

JNO. A. LAW, Chairman.
JNO. W. FRIES,
C. W. JOHNSTON,
LAWRENCE MCRAE,
DAVID JENNINGS,
Committee.

A brief report was then made from the Bill of Lading Committee. No meeting had been held during the year, but in general the bill of lading as adopted by the bankers and the railroads seemed to meet with approval.

The President then introduced A. R. Marsh, President of the New York Cotton Exchange, who had been announced to speak on the subject of the New York Cotton Exchange. In view of the wide differences of opinion as to the scope of the cotton exchanges and their functions in the trade, Mr. Marsh said that he had ventured to change the subject of his topic and would discuss the question, "What is a Cotton Exchange?"

WHAT IS A COTTON EXCHANGE?

By A. R. MARSH, Cotton Exchange, New York

The three great cotton exchanges of the world, known from the cities of their location as the Livpool, New York and New Orleans exchanges, have been in existence about forty years. Few persons now concerned with cotton can ever remember when they did not exist, or can imagine what the cotton business was like before their inauguration. About these great markets the entire cotton world today revolves. The transactions that take place in them, the recorded prices at which the transactions take place, the currents of trade that set through them, even the personalities that rise and fall in public notice within them, all are a natural and familiar part of the lives and thoughts of those who have to do with cotton. Multitudes of persons from California and Texas to Bombay and Yokohama who never visted any one of the exchanges yet know intimately of their operations. The success or failure of their own lives is bound up with what goes on in the exchanges. They produce cotton, or merchandise it, or speculate in it, or spin it, or buy and sell the goods made from it, relying for guidance upon what they learn from the reports of the business done on the exchanges. To enable them all to know quickly and surely what the exchanges indicate about cotton, a marvelously complex and complete system of world-wide communication has been elaborated. As all roads led to Rome, so all the sensory nerves of the cotton trade lead to the cotton exchanges, and then out again through the whole vast economic body.

All this being so, it may not unnaturally appear to some here present rather late in the day to put the question which I have used as the title of this paper. To ask now what a cotton exchange is seems almost like asking a question both trifling and impertinent. Anyone, the first man you meet in the street, can answer it, is likely to be the reflection of those familiar with cotton. And yet no fact has been more strongly borne in upon me during the contentions of the past few years over the cotton exchanges, than that exceedingly few of those who have undertaken to discuss the subject have thought it necessary to arrive at any clear definition in their own minds of the true nature and function of a cotton exchange. It has seemed to be thought unimportant to go through the long and wearisome process of exact analysis of terms before formulating the most sweeping proposals of change in all the methods and practices of the exchanges.

The most arbitrary assertions of what constitute the proper policy and the public duties of the exchanges have been indulged in by critics who could have come no nearer to telling what a cotton exchange is than to say that it is a place where cotton is traded in. It is as if those upon whom the responsibility rests of preparing sound regulations about our banking and currency should start with the assumption that everybody knows what banks are, what money is, and what is meant by credit, when every expert knows that the popular notion of each of these things is inexact and completely insufficient as the basis of any constructive work.

This, then, is my excuse for asking the question, What is a cotton exchange? and my present purpose is to discuss this question briefly, with a view to defining, or, to use a scientific phrase, differentiating the idea of a cotton exchange from other more or less similar conceptions which are currently confused with it and which disturb the proper understanding of what cotton exchanges can or cannot properly undertake to do in the commercial world.

To begin with, let me say that I propose to discuss only such a cotton exchange as shows the all-round development of function which we find in the great exchanges I have named, Liverpool, New York and New Orleans. I do not mean to include those so-called exchanges, like the one at Bremen abroad, and like the many local exchanges in the South, which are hardly more than meeting-places for cotton-traders, or which, at the most, have developed only one side of the cotton business, as, for example, trading in actual cotton on the spot. The cotton exchange which I have in mind is a great general market for cotton, both on the spot and for future delivery; and, above all, it is a cotton market in which the by-laws and rules have been so adjusted on the one hand, to all the varieties of cotton which nature affords, and, on the other, to all the multifarious requirements of the cotton trade, that it has been made possible for the trade generally to enter safely and understandingly into the vast complex mass of credit transactions which are called for in the course of the prolonged and hazardous task of distributing to ultimate users all over the world the gross and unassorted product of millions of cotton producers, great and small, scattered over millions of square miles of cotton-producing territory. Of such exchanges there are, as I have indicated, really only three in the world, though there is a fourth, Havre, which in a limited and local way shows most of the characteristics of the great exchanges.

What, then, are some of the characteristics of such a cotton exchange, or cotton market, as I have described? The first and most important is that it is an association of cotton merchants, of men whose economic function in the world is the distribution of cotton, as nature gives it to us, from the producers to the various users of it, in accordance with the several needs of the latter. It is upon this class of cotton merchants that the world at present reposes the responsibility for providing the ways and means by which every cotton producer can always find an instant market for his crop, no matter what its character may be, and by which the user of cotton wherever he may be, can always be provided with the particular kind of cotton he requires at any time and in any place that he may require it. A cotton exchange, then, has as its central idea the complete adaptation of the business transacted in it to the commercial needs of cotton merchants as a class. Its by-laws and rules must be framed with a view to the needs of cotton merchants, and of no other class of persons. Merchandizing cotton, and no other function, is what these by-laws should be designed to facilitate.

Now, it is at this very point that during the recent discussion of cotton exchanges the greatest confusion of mind has been shown by those who were discontented with the traditional order of things and who pressed their contentions that the cotton exchanges should be remodeled. Various classes of persons who have an interest in cotton, but not the interest of cotton merchants, have appeared, asserting that the old by-laws and rules are unjust and iniquitous, and ought to be changed in a sense more favorable to the interests of these critics. Thus we have had cotton spinners vehemently asserting that they have rights in the case paramount to those of everybody else; that the cotton exchanges have no right to exist unless they make the immediate needs of the spinners the first subject of consideration, and that by-laws and rules which compel spinners making direct use of the exchanges to become general merchandisers of raw cotton impose an intolerable burden upon them.

Again, speculators in cotton, whose sole object in having anything to do with it is to make money through advances or declines in the price, and who desire to avoid as far as possible all the responsibilities of merchants, find that under the operation of the by-laws and rules of the exchanges they are compelled directly or indirectly to assume some of these responsibilities. Accordingly, they lift their voices up in public, denouncing the regime of merchants, and endeavoring to force such a remodeling of the rules and by-laws as will free them from the clogs that impede their speculative operations.

As in these days criticism of the established order of things easily holds the public ear, and as the demand for the tearing down and reconstructing of the most respectable institutions is commonly regarded as presumptively justified, it has been a comparatively simple matter for the discontented spinners and speculators and producers to impress the public with the idea that there must be a good deal in their contentions.

And, finally, cotton producers, not so much of their own motion, as impelled by the general outcry of spinners and speculators that things are wrong, take the field with the contention, that, if cotton exchanges are to exist at all, it should be for the purpose of keeping as high as possible the price of cotton, and that the by-laws and rules should be so amended as to work always in favor of those persons, chiefly speculators, who are endeavoring to do this.

Let us take first the contentions of the spinners with regard to the impropriety of the existing rules and methods of the exchanges, and particularly of the New York Cotton Exchange. As I make out from the published utterances of various spinners and from communications from individual spinners or associations of spinners addressed to the New York Cotton Exchange, there are three chief grounds of complaint. The first is that the contract for the future delivery of cotton is not framed in such a way that the average spinner can buy it with the assurance that, if he desires the actual delivery of the cotton, he will receive exactly that character of cotton which he finds it most advantageous to use in his mill. The second complaint is that the operation of the by-laws and rules governing deliveries on contracts is such that, though the contract is specifically called a "basis middling" contract, the price of contracts at times varies

more or less widely from the price of actual middling cotton, thus introducing an element of uncertainty into the business operations of the spinner, to whom and to whose customers the current price of middling cotton is the market price of cotton as a commodity. The third complaint is that unrestrained speculative operations are permitted on the exchanges, and that violent and incalculable fluctuations in the price of cotton result therefrom, making it difficult for the spinner to forecast with certainty the most important single element in his business, the price of his raw material.

Let us examine seriatim these complaints of the spinner in the light of the definition of a cotton exchange as primarily an association of cotton merchants with by-laws and rules designed to facilitate merchandising cotton as nature produces it, and nothing else. To begin with, the spinner declares that it is unjust to him that when he wishes to use the cotton exchanges directly, and not through the mediation of the cotton merchant, he should be compelled by the by-laws and rules to take delivery of all kinds of cotton on his contracts instead of getting just the kind he finds it most advantageous to spin. Here a moment's consideration will show that there is a fundamental difference between the position of the spinner and that of the cotton merchant. Indeed, this difference is such that the two positions are economically irreconcilable. It is the business and the duty of the cotton merchant to merchandise any and every kind of cotton that is produced. He cannot pick and choose. He cannot leave in the hands of the producer those kinds of cotton which are less advantageous to the spinner, confining his purchases to the kinds for which there is an instant and universal demand. The producer would not tolerate such a procedure, even if the merchant desired to follow it. In the normal course of his business the merchant must acquire great quantities of cotton which are slow and difficult of sale, and the distribution of which must be extended over considerable periods of time. All his trading as a merchant must be governed by this fact, and any arrangement of the rules controlling his trading which fails to take cognizance of this fact is from his point of view fatally defective. It is economically impossible for him to trade on the one side with producers who insist on selling him all the cotton they raise or none; and on the other with buyers of contracts for cotton in gross who can compel him to deliver them only the immediately desirable portion of his purchases. Knowing as he does that ultimately all kinds of cotton are needed and will be sold, he sees no reason for providing a certain class of buyers of cotton with advantages which he himself does not enjoy when he buys himself. As a merchant he cannot in reason be expected to do any such thing. If, then, cotton exchanges are primarily associations of cotton merchants, the contention of spinners on this point falls to the ground by reason of its economic impossibility.

We come now to the complaint that the occasional variation of the price of the "basis middling" contract upon the exchanges from the current price of middling cotton produces unfortunate results in the spinner's business, and that the exchanges are at fault in their rules, if those rules make the variation possible. This complaint the spinner is apt to emphasize by saying that it is the custom of the cotton goods trade to base the price of contracts for goods upon the quotations of the exchanges for contracts for cotton; and that when the price of the latter falls away from that of middling, he labors under great and unjust disadvantages. Perhaps also he adds that when he has "hedged" a contract for goods calling for the use of middling cotton or better by purchasing cotton contracts on the exchanges, it is not right that he should find the parity between the price of the cotton he needs and the cotton contracts he has bought disturbed to his loss. This last allegation need not be taken too seriously; for it was always possible for the spinner to "hedge" his goods contract by means of a contract made with some cotton merchant for specific grades of cotton. Neither is it easy to understand how there can be just cause for complaint, if the spinner has based his own operations in goods upon the happenings in a collateral market, which he is not in a position to understand thoroughly, even if that collateral market is as closely allied to his own as the cotton futures market to the market for goods.

Above and beyond these lesser answers to the spinner's contentions is, however, the fact that the cotton exchanges, through their future contracts, are markets for cotton in gross, just as it is produced and sold by the producer, and not markets for cotton sorted out and made immediately available for the varying requirements of individual spinners. They are great reservoirs into which through "hedge" sales for future delivery the great flood of all kinds of cotton is poured, to be drawn out by the merchants who use them according as the varying requirements of their business demand. Nor is it in harmony with the very idea of their being that they should be used in any other way than as cotton merchants use them, buying and selling in them in gross, and then performing their merchandising function of assorting and distributing as their trade requires. This being so, the only proper theory of the rationale of the price of contracts in these markets is that this price reflects the current value of cotton in gross, and not the value of any particular grade or grades.

The fact that the exchange contract is known as a "basis middling" contract means to the cotton merchant nothing more than that middling cotton is to be taken as the starting point in calculating the value of any given lot of cotton, when it changes hands in the market. It certainly does not mean that the price of contracts is or ought to be the current price for middling cotton. The cotton merchant understands perfectly that conditions may arise and constantly do arise that give to this or that grade of cotton a particular and unusual value, and that this may be true of middling as well as of any other grade. When this occurs, it is certain that the current price of middling will increase, as compared with the price of cotton in gross, and there is nothing uneconomic or contrary to just principles of trade in its doing so. The intelligent cotton merchant is always prepared for having it do so and takes account of the possibility in his merchandising. Thus in the Liverpool market today the price of middling cotton is 30 Liver-

pool points, or $3 a bale above the price of cotton in gross, as shown by the quotations for futures, and this in spite of the presence in that market of many hundreds of thousands of bales of cotton. Middling cotton has become scarce there, and is much in demand, and this fact is indicated by the price. The spinner, then, who quarrels with these phenomena simply shows that his point of view is not that of the cotton merchant. But why should the spinners' point of view be adopted by the exchanges when they exist for the use of merchants?

With regard to the last complaint of the spinners, that excesses of speculation are permitted on the exchanges, which seriously and unwarrantably disturb the conduct of their business, there is in my opinion, as things are today, much more to be said in its justification. Ordinary speculation all economists are agreed can work no real injustice to anybody, because, to be successful, it must be founded upon sound judgment of the true underlying conditions, and it is to everybody's ultimate advantage to have these conditions made effective in the market for any commodity as quickly as possible. On the other hand, ordinary speculation based upon a wrong interpretation of conditions always fails, and produces no permanent effect upon the market. I do not think it can be denied, however, that in recent years there has been a form of speculation in cotton which differs radically from ordinary compeitive speculation and has produced disturbing effects that may rightly be objected to. This speculation to which I refer is based not upon obtaining a part of the profit of the readjustment of the commodity to new conditions of demand and supply, but upon taking violent advantage of the technical procedure of merchants in the exchanges in the matter of "hedges" forcing arbitrary settlements from these unfortunate merchants on their "hedge" contracts, irrespective of the general economic conditions. We had a good illustration of this obnoxious form of speculation in the New York Cotton Exchange last summer, when speculators acquired such vast quantities of "hedge" contracts that they were enabled to force settlements on a considerable part of them at prices which can only be called extortionate in view of the fact that these same speculators were freely selling actual cotton that had been delivered to them, at four or five cents a pound less than they exacted for the settlement of the contracts.

I do not think any right-thinking man can apply to such operations any other terms than uncommercial and even immoral. That they run counter to the long and deep legal tradition of the English race is certain; and it is probable that they are in direct violation of the statutory law of the land. It goes without saying that they are regarded with abhorrence by the reputable cotton merchants who form the bulk of the membership of the exchanges. If the exchanges had the requisite machinery for investigation and prosecution there can be no doubt that a stop would speedily be put to them. Even as it is, the New York Cotton Exchange has, by an almost unanimous vote of a meeting of its members set about the task of incorporating specifically in its by-laws the principles of the national anti-trust act and of the anti-monopoly law of the State of New York. When this has been done, it will be possible for the Exchange itself to put a speedy end to these illegitimate operations, when attempted, and to do away with a grievance which its members believe to have a real basis in fact.

Having now discussed, in the light of the definition of a cotton exchange as primarily an association of cotton merchants, the criticisms of cotton spinners, and having endeavored to show briefly that these criticisms, except for that regarding undue speculation, are lacking in validity, if the exact idea of what a cotton exchange really is remains true, I shall speak much more briefly of the common complaints indulged in by speculators and cotton producers about the exchanges.

With regard to the speculators, I am inclined to give them rather short shrift, for if there is any one primary obligation of the speculator, when he extends his activities into any branch of commerce, it is to take conditions as he finds them, and run his chances with the rules as they are. There is, however, one long-standing complaint of the speculators in cotton which deserves some little attention. This is that there is what almost amounts to a conspiracy on the part of merchants in the exchanges to take unfair advantage of the speculators by delivering them upon their contracts cotton which they are unable instantly to dispose of to spinners. Through this practice, say the speculators, they are continually forced either to sell out their contracts and replace them with contracts for more distant deliveries at a higher price; or else to assume the tedious and expensive burden of merchandising cotton which is not immediately in demand. Such is the complaint, and it is one to which much currency is commonly given whenever a speculative campaign is in progress, or, more particularly, when an overextended speculative campaign ends in a debacle. But, examined in the light of cold reason, it would be hard to conceive of a less substantial complaint.

To begin with, cotton exchanges do not exist for the purpose of giving a profit to speculators, but for the purpose of merchandising cotton. Their by-laws and rules are not framed to the end that speculators may be supplied with just that kind of cotton which is most in demand and readiest of sale, but to the end that the great economic function of distributing the entire cotton crop may be effectively performed. These by-laws and rules do not contemplate the impossible condition that all cotton should be disposed of in a moment, but reflect rather the necessity that great quantities of cotton must be carried along in the stocks of merchants, sometimes for long periods, until it is gradually absorbed by the requirements of trade. There is no conceivable reason why the cotton speculator should not accept these primary obligations of the cotton business, as a real business. There is no reason why, if he ventures into the cotton market at all, he should not bear his part of the expense attaching to the carrying and slow distribution of all that less desirable portion of the cotton crop which merchants have to deal with as a regular part of their business. Left to themselves in the exchanges the merchants make no complaints about the iniquity of being obliged to receive and merchandise any and all kinds of cotton. That is what they trade in,—and all kinds of cotton. Some they sell fast and some they sell slow, but all of it they know they can sell in due course of time. And so long as the by-laws and

rules of the exchange are found equitable by cotton merchants in respect of the character of cotton deliverable on contracts, it is essentially impudent for the speculators to seek modifications for their own special ends.

And, now, finally, a few words about the contention of cotton producers that the cotton exchanges are failing in their duty to them, unless they facilitate the operations of those who are striving to enhance the price of cotton. This contention, as I have indicated above, seems to me rather an echo of the complaints of spinners and speculators, than something originally conceived by the producers themselves. But, whatever its nature, it has undoubtedly played a considerable part in the recent agitation against the exchanges. The one brief, and at the same time, economically sound answer to this complaint is that the supreme duty of cotton exchanges is to facilitate the merchandising of all the cotton which the producer has for sale. Advances and declines in the price are not their proper concern. The most dangerous kind of merchant is one whose business is based upon advances or declines in the price of the commodity he handles. Nobody knows better than the cotton merchants who compose the exchanges that they do not fix the price of cotton; that they would be helpless, if they attempted to do so; and that they have only one proper concern, i. e., buying and selling cotton with a reasonable compensation to themselves for their capital and their brains, at such prices as the law of supply and demand may determine. To ask more of them than this is to ask them to introduce an element of corruption into the entire business. They will never consent to do more than this as long as they remain reputable merchants.

To sum it all up, in the words often used before, cotton exchanges are properly institutions organized by cotton merchants to facilitate the merchandising of cotton. They have no other reason for existence. Their by-laws and rules should be absolutely dominated by this idea and by no other. The one imperative duty they have is to provide for the distribution of the entire cotton crop as nature gives it to us. Any departure from this duty, for the sake of meeting the particular needs or wishes of spinners or speculators or cotton producers, is but a denial of the first principles of their being.

To say that Mr. Marsh held the attention of the assemblage closely, is putting it mildly. During the reading of his paper, the hall gradually filled up and everyone present listened with the keenest interest to his exposition of the point of view of the cotton merchant as to what the proper function of the cotton exchange should be. Whether one agreed with Mr. Marsh or not, everyone appreciated the frank and courageous statement of his views and he was accorded a hearty round of applause when he finished.

Louis W. Parker, Chairman of the Joint Committee on Cotton Exchanges, and an ex-president of the Association, then arose and moved that the thanks of the convention be extended to Mr. Marsh for his presence and for his paper. Mr. Parker then proceeded to take issue with Mr. Marsh, particularly on the point that the cotton exchange existed first of all for the cotton merchants and not for the cotton spinners or producers. Mr. Parker gave specific instances of the evils of the present system and contracts under which the exchange does business, particularly in regard to the disparity of their quotations over the real price of what he called "spot" cotton, but which Mr. Marsh insisted upon should be "middling" cotton. Mr. Parker invited correction of his remarks, and Mr. Marsh accepted the invitation and repeatedly objected to many of Mr. Parker's statements. The debate was extremely animated and intensely interesting. Mr. Parker's remarks were entirely extemporaneous and so rapidly delivered that an accurate stenographic report was not obtainable. Mr. Parker's conclusion was to the effect that if the rules and contracts of the New York Cotton Exchange could be so amended to take into consideration the interests of the spinners and the producers, there seemed to be no alternative but the attempt for some governmental intervention. The question of what was right and moral figured quite largely in the discussion. The convention voted thanks to Mr. Marsh and to the committee, and also voted that the joint committee of the Association should continue its work for another year and confer again with committees of the Cotton Exchange with a view to bringing about some needed reform.

The Committee's report follows:

REPORT OF JOINT COMMITTEE ON COTTON EXCHANGES

To the American Cotton Manufacturers' Association:

At a recent meeting of the board of governors of this Association a committee was appointed to act in harmony with similar committees from other associations of cotton manufacturers, with a view of bringing to the attention of the cotton exchanges the absolute necessity in the interest of legitimate business of the regulation of the rules governing the purchases and sales on these exchanges, in order to make a proper relation be-

tween spot cotton and the price as quoted on the exchanges.

The committees so appointed have not yet presented to the cotton exchanges this question under their recent appointment, but similar committees have done so on previous occasions. The committees so appointed, however, will follow the instructions of their associations and earnestly urge upon the cotton exchanges the importance of this subject.

The subject is not a new one to this Association. During a series of years the Association has put itself on record to the following effect:

That the Association does not feel that it has any fight to make in behalf of cotton manufacturers against such a price for the raw material as affords a legitimate profit to the producer. On the contrary, even though high prices of the commodity temporarily embarrass the manufacturer until there can be brought about a proper relation between the price of the manufactured article and the price of the raw material, nevertheless the manufacturer as cheerfully as he can has endured this embarrassment in the knowledge that it is to the interest of the community at large that the producing element should receive full compensation for their product and should receive such a value therefor as is brought about by the natural law of supply and demand.

Cotton manufacturers must, however, be restive under any condition in which the price of the raw material is not properly reflected in the quotations of cotton exchanges. The effect of this disparity in price is to give to the buyer of cotton goods an impression either that the price of the commodity is an illegitimate one based on manipulation, or, as has been constantly the case, that the price to the manufacturer is less than it really is on account of the misleading quotations on the exchanges.

Committees from this Association have earnestly presented previously to the cotton exchanges such changes in rules as they believe would have the effect of preventing manipulation and of preventing a misleading quotation of price.

It is equally unfortunate to the manufacturer for prices to be unduly low upon the exchange as it is for them to be unduly high, for in either case the price so reflected is the result of manipulation. What the manufacturer demands, and what he has a right to demand, is that the price on the exchanges shall be truly reflective of the price of spot cotton. By no means has this price been so reflective on at least some of the exchanges during recent past seasons.

Manufacturers' associations should have no fight against cotton exchanges if those exchanges truly reflect conditions of spot cotton. On the contrary, an exchange if legitimately managed and regulated, and if the prices ruling thereon are truly representative of spot values, is and should be of decided advantage to cotton manufacturers, as also to producers; but if, on the contrary, the prices reflected on the exchanges are merely the result of speculation for or against the value of the commodity or if those prices are only reflective of the speculative actions of one element as against another element, then the exchange becomes a serious disadvantage to the manufacturers and to producers, and ceases to be a legitimate body.

Of course, the two principal exchanges in the United States are the New Orleans and New York Cotton Exchanges. Under the rules of the New Orleans Exchange the prices ruling thereon are in much closer relation to the prices of spot cotton than as a rule are the prices of contracts on the New York Cotton Exchange. The members of the New Orleans Cotton Exchange have shown a much greater willingness to conform to the suggestion of manufacturers and producers, in order to make their quotations reflective of spot conditions, than have the members of the New York Cotton Exchange. Of course, the operations on the New York Exchange are many times greater than they are upon the New Orleans Exchange, and therefore the unfortunate effects of misquotations on the New York Cotton Exchange are many times what they would be upon the New Orleans Exchange. Apparently members of the New York Cotton Exchange have been more impressed with the necessity of so preserving their rules as to make them advantageous to speculators and manipulators than they have been to make them of such character as to be advantageous to the operations of the manufacturers and producers.

By reason of the rules of the New York Cotton Exchange it is seldom that the prices of contracts on that Exchange are in a parity with spot cotton, or truly represent the prices of spot cotton in the community of production, plus the carrying charge to market.

At times the prices of contracts are much above the prices of spot cotton. At other times they are much below. For instance, during last November and December, the prices ruling upon the New York Cotton Exchange were considerably in excess of the prices of spot cotton in the South. In portions of January and February, the prices on the New York Cotton Exchange were much below those existing in the South and practically from that date to the present this disparity has continued to exist. The result is that in November and December an undue quantity of cotton was attracted by the high prices on the New York Cotton Exchange to that market, and this cotton when so received was simply used as a club with which to depress unduly the prices during subsequent months.

The experience of the present season is not different from what it was the season before and, in fact, in every year for the last five or six years there has been on the New York Cotton Exchange a constant disparity between prices of spot cotton and contract quotations. We were told in the season of 1906-7 that this was an unusual condition, brought about by the unusual quantity of low grades; yet this same disparity existed in the succeeding year, which was not a low grade crop and it has continued to exist at one time or another of the season during each year.

Your committee is forced to conclude that a majority of the members of the New York Cotton Exchange are more impressed with the view that it is to their interest to cater to speculators than to make of their body a legitimate exchange, reflective of the true value of the commodity in

which they deal. It is just as illegitimate for the contract prices upon the New York Cotton Exchange to be one to one and a half cents below the true price of the raw material, as these prices were in January and February, as it is for the prices on the exchanges to be one-half to three-quarters of a cent above the prices of raw material, as they were in November and December, last.

Your committee therefore recommends that they be continued and that this Association once more expresses its earnest hope that the cotton exchanges, and particularly the New York Cotton Exchange, will rectify their rules so as to make a true and proper relation between contract prices and spot cotton, that if these rules be not so properly regulated as to make this relation, that your committee be authorized in the name of the Association to present such memorials to the legislative bodies as may lead to a proper regulation by them of the cotton exchanges. It is a most unfortunate condition when extreme speculation regulates the price of such a commodity as cotton, upon which the fortunes and living conditions of so many thousands of producers and employes are dependent.

Your committee further asks that it be continued with instructions to present these views to the governing powers of the Exchanges, and if relief be not given, to seek remedy through other channels.

Friday morning's session opened earlier than scheduled in order to dispose of some of the left over business from previous meetings.

W. A. Gilreath read his paper on Gin Compression.

GIN COMPRESSION ON COTTON

BY W. A. GILREATH

Mr. President and Gentlemen:

I shall try to make evident the importance of the subject which has been assigned to me, and the importance of something being done by the planters of the South to stop the use of wasteful and extravagant methods of baling cotton.

The majority of the present ginning plants have what are known as steam packers, and, unless these be in perfect shape, to some degree every bale will be water-packed. After being pressed, the bale is ordinarily thrown flat on the ground, thereby absorbing sufficient moisture to make the weight hold out with the gin weights, which otherwise would not be the case. If the farmer holds the bale until it has become to some degree damaged by contact with the ground, it is often disposed of without consideration being had of this damage; in most cases, the seller obtains the same for his cotton as one who has stored and housed the cotton with care; the buyer frequently ignoring the question of damage in the confidence that this question will be likewise ignored by the mill.

If the planter secures as much for his badly handled and more or less damaged cotton as his neighbor who has taken good care of his cotton and stored or carefully protected it at home under cover, how can you expect an improvement in the care and custody of cotton? Resolutions will not suffice; it must be shown to the planter that there is a difference in results to him. Unless, therefore, deduction be made from the proceeds of the damaged bale for such damage, and a premium paid for the bale that has been carefully stored and handled, there is no inducement to improve the marketable condition of cotton. We all judge by comparison, and if we become convinced that there is a financial result in favor of him who carefully gins, handles and offers his cotton, imitation will quickly follow and will bring about a general care of cotton.

Cotton buyers and spinners have been trying for years to induce the farmer to warehouse his cotton; warehouses have been built for the purpose, but today there is little change from the old habits on the part of the planter. The best of these have adopted new methods, but the majority have not; the warehouses as a rule are filled with cotton belonging to buyers and spinners, but not with cotton belonging to planters. Naturally, you cannot pursuade the planter to cover his cotton when he finds that he gets a price no better than his neighbor who does not. The regulation, therefore, in this matter must be by the spinners, who must make a difference in price between that cotton properly ginned and handled and that not in such condition.

It is the spinner who must encourage improved conditions; the planter cannot be expected to make these improvements unless he is to be benefited thereby. It means a loss to buy a gin compress and build the warehouse to hold cotton unless the farmer is to get results therefrom.

The word "tare" has made not only the spinner's life anything but pleasant but has made brokers and buyers lose their legitimate profits, on account of the fact that these latter are docked as a consequence of excessive use of bagging and ties. I wish there was not a patch put on cotton; generally it is unnecessary. When I started in the cotton business, I wondered how some were paying more for cotton than I was paying and yet selling it for less than I could accept. I found out the reason: I was shipping cotton to the mill uncompressed, at true weight, without being credited with three pounds allowance and with three to five pounds of excess bagging covering patch holes. When cotton was 10 cents a pound, such methods gave the compress buyer 1/4 cent advantage. How can the buyer that wants to do anything that is just and right compete with another buyer who sells compressed cotton, including in his invoice an excess tare placed by him upon bales, which tare, while costing him little, must be paid for by the mill at the market price of cotton?

These conditions are familiar to you all, but I wish only to refresh your memory.

With gin-compression the improvement in method of handling cotton commences the minute it is delivered from the gin, inasmuch as it is delivered in neat, smooth folds of lint, and packed carefully as each fold is put in, until the desired weight, say 500 pounds, is obtained. It is then au-

tomatically transferred and carefully compressed in the box in which it is packed, instead of having to be subsequently transferred after baling for compression. The bale can be packed in any shape or size, made either square or rectangular. The burlap or bagging is put on in a manner similar to that done in ordinary ginning or compressing. The question of the amount of tare must be settled by spinners. The gin compressors have started the use of 12 pounds of tare, which is sufficient to cover the bale carefully and neatly. I have on exhibit a bale which came out of a 100-bale shipment sold to one of your members; you can see the condition of it after it has been handled a number of times, and this condition shows that it is unnecessary to use the heavy jute bagging for cotton pressed in a gin compress. The expense of this gin compress is most considerable, for it is necessary to expend approximately $4,000 for such a press, and, as cotton after compression should never be exposed to the elements, there must naturally be a warehouse constructed adjacent to each gin. I have here a picture of one of these outfits at Race Track Plantation, owned by Mr. S. F. Jones of Greenwood, Miss. Such a plant would have been put out of comission were it not in strong hands, for previously those who have attempted the use of it have been boycotted by buyers, who saw gin-compression to be a method of cutting them out of the illegitimate profits previously obtained by them through the loading of cotton with excess tare. Mr. Jones, however, has met this by making direct connections with mills familiar with his cotton and knowing its excellent character. He deserves the preference he has received, because he delivers the article he sells with the least tare, in the quickest time, deducting tare from invoice, selling only, therefore, the actual weight of the cotton, and selling cotton never exposed to weather damage.

Gin-compression has so far made most progress in the delta, because the planters there have the means and are most intelligent, and are, furthermore, anxious to bring home to buyers the excellent character of their staple as contrasted with that raised elsewhere. By visiting this section it will be readily seen why cotton varies in breaking strength.

I would suggest to my spinner friends that they secure one shipment of cotton baled in a gin compress and run it through their mill separate and distinct from other cotton; you will then be convinced of the correctness of the statement that such cotton is more excellent in character than cotton ginned and baled in the usual method.

When sufficient cotton be purchased from any locality where it has been gin-compressed to fill a car, it can be carried direct from the spinning point to place of destination without being unloaded for concentration or for compression. The ordinary freight car will contain 75 to 100 bales of gin-compressed cotton, as against 25 to 40 bales of ordinary flat cotton, and as compared with 60 to 75 bales of ordinary compressed cotton. There is necessarily a saving to the buyer of the freight on the excess tare which accompanies the large compressed bale; and there is a saving to the railroads in that it is not necessary to rehandle the cotton after loading until receipt at destination. There is a saving of time in transit, as it is not necessary to unload at the compress and re-load after compression. This saving in time of transit means a saving of interest, which is important to each manufacturer. With 1 1/4-inch cotton, at the price now ruling, and figuring interest at 6 per cent. the saving that can be fairly calculated in interest alone is $62.50 on each 100 bales.

There are other savings, however; based on the Carolina Mill Rules of 1910, which allow 24 pounds of tare to the compressed bale, there is a saving of 24 pounds in tare, which at 20 cents per pound is $4.80. The saving on the freight on this tare would be in the average 10 cents per bale, and when consideration is further had of the different manner in which the cotton reaches you, clean and without country damage, it is not too much to say that the manufacturer would have an advantage equal to fully $6.00 per bale in gin-compressed cotton over cotton ordinarily baled and compressed.

But, to induce such method of ginning and of compressing, it is necessary for the manufacturer to hold out an inducement to the planter. Such inducement will be to allow to the planter, either in the price paid for the cotton or otherwise, an amount equivalent to the difference in the weight of the tare; and, furthermore, to allow to such planter the equivalent of at least 1/4 cent per pound as a premium to him who properly gins and bales his cotton.

The trouble in bringing about a change from the wasteful way in which cotton is ordinarily baled is that the planter naturally expects reimbursement for his extra outlay and extra expense, whilst the spinner has been unwilling to pay for the differences in tare and the equivalent of the differences in expense. But it will be impossible to popularize a better bale unless you pay the planter for the change; he is just about as smart in his line as you are in yours. There can be saved to you the loss in time, the sampling and re-sampling at the compresses, the loss in interest, the loss in country damage, if you will encourage a more intelligent method of baling.

There have been organized in sections of the South responsible companies for the purpose of installing gin compresses and handling the product after compression. Recognition should be made by you of such companies and they should be encouraged in their effort to induce the improved methods of baling.

Under a proper method of marketing gin-compressed cotton, three samples should be drawn from each bale,—one from the center and one from each side after the bale is in position to be compressed, or before it is weighed, and without disturbing the folds of the cotton. A number corresponding with the bale is placed in these samples, and the samples can be therefore subsequently classed and returned to the gin compress and class entered on the gin books opposite the weights, so that each planter can know exactly what he has for sale and the value thereof. When you buy from such responsible companies according to the types sent to you by them, you can rest assured that you will get exactly what the

type shows and will receive the amount of cotton you pay for.

What encouragement are spinners to offer? Is the planter to be assured that he can depend upon getting at least a fair increase over what we paid for a bale sold not at net weight but carrying excessive bagging, country damage, etc.? The matter can be determined by the spinners; and I believe that you will hold out encouragement to the intelligent planter by giving him such reasonable increase in price. If you do, I believe that the results will be more than satisfactory to you and that both planter and spinner will have saved money by the change from a wasteful, extravagant method of baling and handling cotton to an intelligent and careful method.

There is no argument against gin compression; it is said that the cotton cannot be sampled and that there will not be warehouses for distribution. I think, however, that such arguments will be found to come from those interested in the maintenance of present methods, or in the continuance of existing compresses.

Buyers of cotton have been heretofore buying bagging at 2 cents a pound and selling it as cotton at from 12 to 20 cents a pound, making thereby a profit out of an unfair loading of the bale, to the disadvantage of both the mill and the planter. This deception has been going on for years. Does the spinner desire to buy cotton on does he desire to buy bagging? If you desire a change, it is you who must take the lead and show to the planter that you will encourage this intelligent method of gin compression, and that you will give it the preference by allowing him a reasonable excess in price as a premium for the intelligent handling of cotton.

In conclusion, and summarizing the advantages of gin compression: The cotton will come to you in better shape and without damage; it will be covered with bagging of less weight than usual, not making you pay thereby freight on bagging; you will save interest on the money expended and will receive your cotton with less delay; you will receive just what you pay for. Under all these conditions, is it not your duty to encourage those who are seeking an improvement in conditions?

At the conclusion of this paper, the subject of better baling was discussed. Mr. Sturdivant, one of the Mississippi planters present, explained the steps that had been taken by the Yazoo & Mississippi Valley Cotton Co. to produce a high grade of cotton which should be uniform and put up in a satisfactory form. He stated plainly that as long as the cotton panter received no better price for cotton put up in good bales, gin compressed, he naturally would not go to the expense of installing the necessary apparatus. It was up to the spinners to pay a premium for well baled cotton if they wanted it. There was some discussion on this point and Mr. Sturdivant thought that $1 a bale would be a fair beginning. A South Carolina planter spoke of the efforts that were being made to improve the staple and baling methods in South Carolina, saying that prizes would be offered at an exposition to be held this fall and the Mississippi planters were invited to participate for a special prize that would be offered for their class of cotton.

President Cooper thanked the visiting planters for their presence, and it was generally appreciated that it would be of mutual advantage for the growers and spinners to get together and discuss each other's point of view.

Howard Ayres of the China & Japan Trading Co. omitted the formal reading of his paper, which follows, owing to the lack of time, and spoke informally of the methods of the Cotton Goods Export Association and how the China trade is done.

THE IMPORTANCE AND POSSIBILITIES OF A COTTON GOODS EXPORT ASSOCIATION

BY HOWARD AYRES

The export trade is a struggle for existence, not only of individuals but of nations. Those who are trying to maintain the export of cotton manufactuerd goods in the foreign commerce of the United States are engaged not so much in an effort to absorb it for themselves individually as in the keener competition of merchants and manufacturers of other countries for such world markets as are open for the products of our mills. It is a peculiarly hard fight, in which we have won our way by merit of merchandise, by pluck and persistence, but on a margin so narrow that often by sacrifice only has the field been kept. In this competition with other producing countries we have the theoretical protection and cooperation of our own government. We trade under the arms of treaties assuring to us equal rights, ample in their provisions and supported by the whole power of a strong and respected government. There is no question of security of person and property. We are offered the services of highly-organized and numerously-manned bureaus of governmental activity in gathering information. More than that, there is in all these agencies of government a very earnest desire to help. The sincerity of intention is undoubted, and the activity considerable. The difficulty there is that the men employed have had no business training, and lack the sense of proportion, that perception of the fitness of things that schools and books cannot give, and that can be won nowhere but on the battlefield of trade. There theory gives place to hardened experience, very much as most of the

pomp and circumstance of the establishment of war is left when men fight for life and power. Perhaps in this direction lies a principle use for an export association. There is no occasion for a display of force or anything approaching compulsion. The men are ready and anxious to do any reasonable work required of them, but it needs more than the request of an individual to convince a department or bureau of the government that what it is doing may not be the highest and most intelligent service. Moreover, the individual does not always know just what is most wanted, or have time to work out the detail and formulate the request. The process of education is within as well as without. An organization must have a very clear perception of that which will best advance the interests of its members before it can be at all convincing in quarters where it seeks help or protection, and such knowledge can only be acquired by the consultation and interchange of ideas possible in a compact and homogeneous membership. If an association has many and diverse interests, is trying to cover too wide a field, to become of political and social importance as well as commercial, it is difficult to concentrate its activities into specific benefit such as is required by those seeking to do an export business.

For instance, no one thing is so strongly desired by the cotton manufacturers of this country and their agents as a revival of the export trade in cloth with China. True, that is not the whole of the export trade in that article; other countries take a very considerable quantity of the product of our mills, and will take more as trade adjusts itself to coming new conditions, but China has been the large buyer of that kind of cloth in which we can most successfully compete with other producing countries, and in normal years has fortuitously come into the market here at times when it was most convenient for mills to make long contracts for substantial quantities of coarse yarn cloth as a basis of the year's entire production.

There is much to be desired to foster trade with other countries, a greater enlightenment on local business conditions, protection of tradmarks, settlement of customs and freight matters, details of various sorts, that will well repay attention and effort; but with the China trade many things are wrong besides these ordinary affairs. It would be idle to say that by effort the situation can be righted, but by attention at the proper time and in the best way much can be done to bring about such an improvement in conditions as will hold promise for the future. The situation is internaitonal in such a complicated way that action must necessarily be governmental, and before that can be brought about our government must be informed of the magnitude of the interests involved and the necessity for taking a determined stand for the rights and interests of its merchants and manufacturers. There are associations to which the China trade is of considerable interest, but is only one of many things occupying their time and labor. They are chiefly concerned with matters of nearer commercial and political concern. What one of them can concentrate its activities upon an international situation complex beyond comparison, requiring long experience for even partial comprehension, and in any approach requiring a discretion that can come from knowledge only? It is not enough to demand of the government of the United States that something be done. The perfunctory, which is the usual, is too easily put in operation to accomplish very much. The duty of this government towards China is very clear and the responsibility grave. Unfortunately there does not just now appear on the part of those in authority a perception of what is required nor any intention to perform that duty. China's perils are extreme, both within and without. The United States, because of its neutrality on questions of Chinese territory and national existence, is conspicuously fitted to lead the nations in the attempt to remove those perils. If selfish interests of any one nation threaten China's safety or development the United States can without reproach of self-seeking use the controlling strength of the other powers with its own, and put a stop to the aggressions. If China continues helpless in the throes of its awakening, we can direct joint action to bring order out of chaos. With great natural resources, a teeming population of great industry and thrift, China needs only safety from without and order within to become the great market of the world. A share of its commerce belongs to us, but we shall not have it unless we look after it.

No movement, commercial or other can succeed if inspired by selfish ,motive, and no association can carry out its purposes if it is designed or intended to foster the interests of one group only of those concerned in the direction along which it is working. In this export trade in cotton cloth, leaving out the numerous interests indirectly affected, there are three groups concerned, the manufacturers, their selling agents, and the exporting merchants having establishments or agents in foreign countries. There is a benevolent notion abroad that the existing Cotton Goods Export Association of New York, having been established by the exporters of that city, is of value to them only, and that the amiable thing to do is to support it for their benefit. As a matter of fact, perhaps their interest is the least of the three. The exporter cannot exist on any one line of trade. He must do as much business as possible in every article bought or sold by the markets to which he is trading, for his operations must be import also. His vitality depends upon his ability to change with changing conditions, to get along wthout those articles in which he cannot trade profitably, and to take up those for which new demand can be found or made. The survivors of the old houses that established the foreign trade of the United States with the countries to which cotton cloth can be sent are those who had no prejudices, were willing to surrender preconceived notions, to admit that there are some things about which no man can afford to be too positive, and could adapt themselves to new conditions of trade. An epoch in the history of the export trade of the United States was the cataclysm by which one of the articles most largely and generally dealt in

was lifted bodily and suddenly out of the mercantile field. Yet the export houses survived, turned their attention to other things, and have grown. It is not a matter of indifference with the exporters, however, and they are prepared to throw themselves vigorously into the fight, which must be made jointly by these three interests to protect the trade. For the manufacturers and their agents the maintenance and growth of the export trade in cotton cloth is of greater importance. The percentage of goods exported to those taken by the great home market may be small, but it has been prepared for by mills built and equipped for it, and if by interruption or entire loss of that export trade the production of those mills is diverted occasionally or permanently to fields already occupied by others, there is not a mill in the country, no matter how remote from export experience or how highly specialized its product, that will not feel adversely the effect. It will be contended that the growth of the home demand will gradually absorb this additional capacity. Doubtless, but it will be a new era if there is not a commensurate growth of new mills, leaving the situation unaltered. Idle spindles do not make an ideal remedy for poor demand, and a dependable export trade might prevent recourse to that expedient.

Without describing the various ways in which an export association may make itself useful and valuable in the routine transaction of business, and upon the details that often need attention hardly possible for the individual to give, and requiring such a basis of mutual acquiescence as membership conveys, an organized activity the extent of which depends upon the strength of the organization and the limit of expense members are willing to assume, it will be profitable to consider for a moment what such an association may be able to do to prevent confusion among trade-marks. In the trade in cotton cloth imitation of trade-marks, often of considerable value in foreign markets, is rarely intentional. Instances of piracy are very few. On the other hand, similarity of marks, if not duplication, is not infrequent. The reason for this is that marks are seldom seen except by those dealing in the goods branded, and there is no governmental place of registration to which informal and expeditious appeal can be made for information and advice. In the search for new brands one will be worked out that will unwittingly be more or less close imitation of one already being used by another maker or shipper. Particularly is this so of foreign markets in which the actual goods are seldom seen outside of original packages by first hands. So important was some precaution against this sort of interference considered in Shanghai, China, some years ago, that the General Chamber of Commerce then established a bureau of registration, having no legal status, to be sure, but serving for search and comparison. A similar bureau exists in New York, has proved useful, and only needs wider use to be of great value.

And another almost indispensable form of activity for an export association is along the lines of arbitration. It may be even more utopian to talk of the day when there shall be no lawsuit than to preach universal peace among nations; but there is a very marked movement towards arbitration as a mode of settlement of commercial controversies and differences. It is probably within the experience of most business men to regret that some dispute should have reached a court of law, and to realize that if it could have been laid before arbitrators, expert in the question involved, time and money could have been saved, hard feeling avoided, and exact justice secured. Such a recourse has peculiar value in export trade, when many details beyond the experience of the casual man are found, and in which questions arise that can with difficulty be dealt with by ordinary process of law. A case may be really very simple that would be almost impossible to make clear to a jury. When business is done with a market at a great distance, under conditions that make necessary a procedure giving rise to methods called "customs of trade," to which mutual agreement has grown out of a long period of satisfactory and honorable dealing hardly to be matched elsewhere, there is a condition existing that places a premium upon arbitration. Take, for instance, the question of quality, which, in spite of best intentions, does sometimes arise with manufacturer, seller and first buyer in our country, the distributing buyer and consumer in another, the goods packed and shipped at the mill and in the possession of transportation agencies till distant destination is reached. If it is claimed that the goods are not as sold, that some imperfection exists, a dispute arises that would drag interminably in the courts, with an ultimate result by no means certain to either party. Arbitration of such a case by men familiar with conditions would be speedy and beyond any doubt satisfactory. The requirement is merely voluntary submission by both parties to the dispute, with agreement not to withdraw after the arbitrators have taken the case in hand, and to accept as final the decision.

The Cotton Goods Export Association of New York is an existing organization that has performed some of these functions, is capable of those suggested here, and of any expansion required by the exigencies and opportunities of trade. Established in 1905 by the exporting houses, to meet a condition of threatening confusion at that time, much misunderstood in its purposes and aims by the selling houses, who were invited to cooperate, it has worked along quietly and in a small way effectively. Its original object has been taken up by the manufacturers themselves, in the adoption of the uniform sales note, and the Association comes now to the wide field of work for an expansion of trade, encouraged and strengthened by the accession of manufacturers and their agents to membership, and by expressions of sympathetic understanding and promise of cooperation. It can be made of such use to members as their active interest and participation may direct. In the collection and dissemination of information, and such other services as organizations usually perform, there is a large work to be performed as fast as required and provided for. In the broader and more intricate work that the peculiar needs of the export trade may from time to time have need of, there is room for wise direction that members must expect to

give. The Association will undertake to do these things, or will give place to another better fitted to the purpose. The work is urgent for some organization, but none can be wiser or more active than its members make it.

J. E. Chesman, of New York, then spoke in part as follows:

THE PRESENT STATUS OF THE COTTON GINNING INDUSTRY THE WORLD OVER

BY J. E. CHEESMAN

The real evils of the cotton ginning problem of this country are:

First, the saw gin evil.

Second, the custom of buying cotton.

What is a saw gin? Let us see if, in its very mechanical principle and construction, it has the power to injure cotton. Kindly examine the cut showing a cross section of an up-to-date saw gin and feeder and follow the description.

The feeder is filled with seed cotton, which, being carried forward by the apron, is picked up by the feeder drum and passed over and above, then falling upon the cleaning drum, dragged against the wire screen and deposited in the roll box or breast of the gin. The roll box is filled with seed cotton before the gin starts. You will observe the saws, 1/32 of an inch in thickness, from 60 to 80, placed upon a shaft three-fourths of an inch apart from center to center of saws, which run between slats or grid bars, having an opening of about 5/32 of an inch—not large enough for a seed to pass through. The saws having sharp teeth run upward through this mass of seed cotton at a speed of 400 to 500 revolutions per minute, tear what cotton they can from the seed and pass between the slats or grid, which holds back the seed. The brush roller, running in an opposite direction to the saws and three times as fast, wipes the cotton fibers from the teeth and at the same time blows the cotton into the lint flue, furnishing the air to carry it to the condenser. The faster you run the saws the greater the capacity and greater likewise the force exerted against the fibers of the cotton. The opening in the grid bars becomes clogged and filled with sand-dirt and damp cotton to some extent, the saws continue running and something must give. The under part of the roll is constantly pulled against the grid bars and the saws cut their way through; hence the word ginning, "an engine of torture." If cotton is damp or wet, the clogging is more apparent and petroleum is poured into the roll of cotton to lubricate the teeth and grid-bar openings so the cotton will pass through and be more easily removed by the brush. When the feeder is about empty (there is always a little left because the roller will not pick it all up) the ginner stops the gin with the "roll box" full of seed cotton, mixed with partly-ginned seeds. The new lot of seed cotton is then sucked up and deposited in the feeder, mixing with what was left therein. The gin starts, cotton falls into the roll full of the "other fellow's" cotton and is ginned—a mixed bale.

Over 75 per cent. of all the cotton grown in America is ginned by the public ginning plants. The day of the small gin plant has passed, only a few large plantations now having their own gins. Compare the cotton ginned at the plantations by the owners of the cotton, with that ginned on the public gins and the difference is quite marked. Slower speed and greater care marks the one as against high speed and careless methods in the other.

The cotton planter depending upon the public gin to gin his cotton on toll, paying from $2.50 to $4.00 per bale, is a very patient, long-suffering individual or else he is ignorant and very careless. One has only to visit the average public gin during the cotton season to solve the problems of waste, gin cut, nits and motes—the problem you meet each day in your mill. I heartily approve of the public gin, when run to produce the best results and give its customers honest and careful work, for then they are a benefit to the community. But the "custom" controlling these plants is wrong, partly by the fault of the owners and managers desiring to swell their daily earnings by ginning as many bales as possible within the hours of operation. But Mr. "Cotton Farmer," even in the South, seems to be in a hurry. He goes to the public gin where he can get the quickest work and urges the public gin to "cut his bale out quick," and it is "cut" by speeding the gins to 500 revolutions per minute and the farmer loses. The ginner receives his "toll," the farmer not only pays for his ginning but has lost five dollars, or one cent per pound, and often more, because he demanded speed—and the mill receives "gin cut cotton." The cotton buyer and mill expert complain of false-packed bales, two-sided bales, mixed bales, short and long cotton in same bale. You condemn the planter and call him dishonest. I hold that the standard of honesty among the planters of cotton is as high as that of any other branch of industry where crops are harvested and prepared for the market.

The responsibility is divided between the managers of the public gins desiring quick returns, the saw gins as constructed and operated, and the planter urging speed in cutting out his bale. The evil rests with managers and their custom in ginning on toll with saw gins. The very methods employed, where different cottons come to the gin, produce mixed bales. No. 1 wagon of seed cotton is short and trashy. No. 2 following that load is staple cotton and clean picked. Care has been taken in the planting, raising and picking. No. 1 gins out his cotton all but that remaining in the feeder and breasts or roll box of the gins, in order that they may start again with a light roll box and in so doing save time, which is money to them. No. 2 follows with his good cotton. The gins start and in the bottom of his bale he receives what was left of No. 1's cotton—just enough of the poor cotton is in evidence to condemn the real value of his bale and it is mixed. He is the loser and you often reject the bale.

It is a strange condition—this lack of interest on the part of the cotton manufacturer as to the ginning of cotton. Not one cotton manufacturer in a hundred has any real, practical knowledge of the ginning of cotton; and, carrying it still further, it is also true of the cotton broker, buyer and middleman. The average man dealing in cotton, buying and marketing the most valuable crop in the

world, knows very little of the value of the cotton he buys and sells. He is a copyist and lives by his wits. He is not educated in cotton.

What is the prime object in ginning? Is it not to so gin the cotton as to better prepare it for the spinner, that he may find less waste in his mill and produce stronger yarn and better goods? We know that 90 per cent. of all the cotton grown in the United States is spun into yarn, hence it is a spinning proposition. Are you satisfied with the 13 to 18 per cent. of waste in your cards and the 30 to 40 per cent. waste in your combers, depending upon the grade of cotton used as well as the setting of your machines?

Does not this waste tell a story of cotton badly prepared for your use? Are you satisfied to rest passively and contented in this matter and make no effort to encourage better ginning? I think not. Why should the cotton manufacturer be content to let the ginning of cotton remain a farmer's proposition and give no thought whaever to the bettering of the present conditions? I see no reason why the ginning of cotton should not be a mill proposition as much as a farmer's, or a public gin business. You cry out against the evils and do nothing to prevent them. The pendulum is swinging the other way just now.

It is reported upon very good authority, that the Fine Spinners and Doublers Association, of Manchester, England, representing thirty-two mills, have recently joined with Southern capitalists in securing over thirty thousand acres of delta cotton land in Bolivar County, Mississippi. This initial step on the part of the English spinner is only one movement in a general plan to prevent American monopoly of the staple cottons of this country, as well as to better prepare it for his use.

They will grow their cottons scientifically and we may rest assured it will be roller ginned and better baled. Will the American manufacturer rest content and make no effort to furnish his mill with its supply of staple cottons, prepared for his use in proper manner?

The high prices paid this year for poor cotton make it imperative for the mills to take some action in this matter and not be content to permit the old and wasteful methods to grow and further dominate the ginning of cotton. It is not alone the wasteful methods of ginning. You also suffer the loss in extra tare and loss of cotton due to the shameful, degrading, American bale. You know this loss better than I.

We must go to Egypt and there learn a lesson of how to gin and bale our cottons. Egyptian cotton is roller ginned and the compressed bales, weighing 750 pounds, are covered with close-webbed burlap and tied with eleven iron bands, and the tare is only 22 pounds. You get the cotton before you pay for it and you know what you are getting. We cannot close our eyes to the progress Egypt is making in the culture of cotton. She has long since learned her lesson—how to gin cotton, as well as how to cover it for the market. Now, Egypt is hybridizing her cottons, improving present types, creating new ones to meet the demand for her cottons. This year we find two new types of Egyptian cottons; one of them has created favorable comment and is known as "Sakalarids," comparing very favorable in length, color and fineness of staple with our best Georgia Sea Islands. When Egypt finds her crop deteriorating from any cause whatever, either in waste, methods of cultivation, inattention to planting, seed selection or by devastating cotton worms or bugs, her Government (England) steps in and calls a halt, and forces better conditions, as she did this past year. The result is very evident in the largest crop ever grown in Egypt—730,000,000 pounds, or 1,500,000 of 500-pound bales, and valued at $150,000,000. If there is any country in the world threatening the supremacy of America in cotton raising, it is Egypt. When she further extends, as she has already started with 20,000 acres under cultivation, the growing of cotton in the Soudan, vast in its possibilities, then Egypt will come into greater prominence and be a powerful competitor in cotton raising. Her power and influence is felt this year. Mr. Boll Weevil has entered the Mississippi delta and Egypt will be the gainer. But the greatest conundrum to me in cotton is the ever-existing fact that the cotton mills using staples buy Egyptian cotton, roller ginned, without question of appearance or preparation. They like it, approve of it, praise its ginning, because they find it works better in the mill and saves them money in their card and comber waste, and still they will condemn Mississippi delta staples of roller ginned, even laugh at it because of its appearance, and do this without trial. If they would test our staples roller ginned, they would approve.

There is one fact, one truth absolutely certain, and it is this: If the planters of the Mississippi delta continue to saw-gin their cottons, their market will pass from them and the mills will buy Egyptian. And why? Because the cotton manufacturer is learning the value of roller ginning of long staple cotton. Egypt is teaching the American manufacturer a lesson in how to prepare the fine cottons for the market. The Egyptian cotton does not take the place of all delta cottons. We do not claim this; but the planter of the finer delta staples, insisting on ginning by the saw gins, decreases very materially the value of his cotton and will find it harder each year to market his crop, unless he, too, learns the lesson from Egypt. It remains for the manufacturer to demand better ginning. When he does, the planter and ginner will give it.

The Sea Island cotton of this country can also teach us a lesson in ginning and baling. Roller gins are exclusively used and the cotton covered with burlap and sewed in neat and uniform packages, weighing on an average 400 pounds.

We have always pointed to the Mississippi delta with pride as the home of the best cotton grown on earth, aside from the Sea Island. But how little attention have we paid to the ginning of it. What is the use of improving cotton in staple if we proceed to undo the work of years by abusing it in the very first mechanical treatment it is subjected to? The Egyptian laughs at our foolishness. We gin and prepare this fine cotton for the market in the same manner as we do the short cotton. If the staple cottons of this country were ginned on the roller type gins and baled as well as Egypt covers her cotton, it would be a great blessing to the mills using the finer grades and save to the growers of fine cottons millions of dollars a

year, and the waste in your mills would be reduced to a minimum.

All these truths are not new. You have heard them before. Papers have been read at your conventions treating on the different phases of the cotton conditions of our country. It is an old truth. The "Cotton South" would not wake up. The cotton mills have been content to travel in the rut of custom. Man could not, or rather would not, change his habits. It remained for a seemingly insignificant bug of a quarter of an inch in length, the "boll weevil" to rouse the cotton growers of the South and force upon them scientific farming. And today we see the United States Government, through its Department of Agriculture and Bureau of Plant Industry, assisting the cotton planters all over the South in ways and means of combating this devastating army. It is a blessing in disguise, for today we find all over the South, hundreds of experimental fields of cotton, grown by scientific methods introduced by the Government and under its inspection.

The cotton planter is learning how to combat the boll weevil by seed selection, early planting, strict attention to cultivation, proper fertilization, the cleaning of the fields and burning of the stalks and fallen bolls. He finds now, under the changing conditions, that he can raise a bale and more per acre, where he formerly raised but half a bale.

The raising of cotton has never been taken seriously. The land—in great abundance—and so fertile that cotton would grow somehow or other no matter what was done, and if nature was kind, a crop would be made. But now a change has come. The boll weevil compels attention. The South is awakening to a new condition and beginning to learn scientific farming and raising of cotton. They appreciate the value of cotton today more than they ever have since the war, and with this knowledge, they will also learn better ways of ginning and baling.

The Second Evil of the Cotton Problem is the Custom of Buying Cotton.

One of the evils of the present system of judging the merits of cotton is based upon the "habit" of the man pulling the staple for length and waste. If he be buyer, he pulls short and discovers the imperfections; but if he be a seller, the same cotton looks mighty good. This applies more particularly to the Peelers and Staples. We all can tell with some degree of accuracy the difference in full grades of short cotton, but it takes a vivid imagination and a very elastic conscience to determine the quarter and half grades and place upon them the values according to the differences on the New York Cotton Exchange or spot basis in the South. We need, as others have told you before, a simple, inexpensive, standard and universally adopted machine for pulling cotton and determining amount of waste. Within a year you will have a chance to try it. But the great question in my mind is, will the buyers of cotton trust it? Do they really want a court of accurate and final decision? I doubt it. We cotton men know little about cotton in its raw state as it comes to the mill. We often think we do when we pull it, but we find the cards and combers tell the truth and we awaken to the fact that we have lost and our judgment was wrong. In other words, it is a gamble the mill is taking on every lot of cotton bought when the brand is not known. You want Mississippi delta cotton from certain districts and you think you are getting it, but are you? The delta in the Southern brokers' geography is a thousand miles long and wide at times, and this is true of other sections and of other cottons.

There are two words in the vocabulary of cotton, when applied to lint cotton "covering a multitude of sins." The cotton mill buyer uses the expression "appearance," the Southern ginner calls it "preparation." They are synonymous and cotton is often purchased or condemned on this alone, without any effort made to ascertain the length and uniformity of staple and amount of waste. The latter can hardly be determined by any experts with any degree of success. It remains for the mill machinery to correctly analyze this condition.

When either of these words "appearance" or "preparation" are used sincerely and honestly in determining the results of saw ginning, whether it be well prepared or poorly, gin cut or not, then I stand in favor of its use. My objection is when they are used by cotton buyers, in the field or in the mill, to determine the relative values of saw vs. roller ginning. There is not a man living who can determine the value of cotton simply on appearance. The average cotton expert, when confronted with a sample of cotton differing in appearance from that he is accustomed to, will hide in the shadow of this word and look wise. But, he has said nothing.

I have presented to brokers, buyers and even mill experts, roller-ginned cotton absolutely free from gin-cut waste, nits, motes and saw-gin evils, the very things in cotton the mill condemns and wants removed, only to have the cotton turned down and ridiculed, even to the point of embarrassment, and why? This eternal cotton—why? Because it did not look like saw-ginned cotton—did not contain nits, motes and abundance of waste such as they were in the habit of buying. The very removing of the evils you condemn in saw ginning precluded the possibility of a sale. The appearance was strange and the buyer did not dare risk his judgment. Have you ever removed the seeds from cotton by hand? If so, then you know how roller-ginned cotton looks. It is lock by lock in a measure—very little disturbed, except that the fibers are straightened to some extent and present a solid and flat appearance. The less you disturb cotton in the process of ginning, the less injury you impart to the fibers, and the better the product is prepared for the mill. But, alas! This unusual care and unusual success produces an unusual appearance. But what does all this so-called "appearance" or "preparation" amount to, looking at it from the mill standpoint? As soon as the mill opens the bale, it proceeds to beat it to death and change the appearance beyond any possible recognition of its former self in the first two machines employed in the cotton mill. The destructive "beater" of the opener kills all "appearance," and, not satisfied with this injury imparted to the cotton, fresh mutilation is applied in the rapidly running "knife beater" of the "picker." Where is

the value from a mill standpoint in the so-called "preparation?"

J. M. Smith, Manager of the Industrial Department of the Buckeye Electric Co., of Cleveland, Ohio, who had courteously given way to other speakers who were behind him on the list, then read his paper, which follows:

LIGHTING THE WAY TO PROFITS IN A COTTON MILL

BY J. M. SMITH

Many wide awake managers have recently convinced themselves of the value of good illumination, but there remains in many places a great opportunity for improvement. There are mills in actual operation in the South, where a single 16 candle-power incandescent lamp, without the assistance of any reflector, is called upon to light four looms. Why, in even the best of the older installations, a pair of looms was fitted with only one such lamp in the weave alley and one in the warp alley. This lack of attention to details in illumination is the more surprising when we consider the really great results to be obtained by properly designed lighting.

Installing good light in a cotton mill will increase the output, make more efficient operators, and show big returns on the necessary investment. This is a pretty strong statement, but let us look into the matter. In the first place it brings up the output for every hour of the day, to about that obtained under daylight conditions. This means that the entire plant from engine to looms are operating under a better load factor and the quantity turned out will therefore be a maximum.

Some machines, which could not be operated at all satisfactorily after dark with the usual inefficient lighting, can with well designed illumination be run when needed and the output forced up, but the largest gain in production results from reducing the amount of time lost during the actual times when the machines are supposed to be in use. In the earlier stages of the manufacture of cotton goods it is necessary to oversee and feed the various machines and a good general illumination enables the operators to see with certainty where their attention is needed. In mill operation, two principles stand out as characteristic.

1. Any irregularity of operation, broken thread in warp, floats, etc., should be "spotted" surely and quickly.

2. The required attention, adjustment, or replacing should be done in the minimum time.

To fulfill both of these conditions, good lighting is essential and every second that a loom or spindle is stopped, awaiting attention, cuts down the output. Every second saved in tying in a new thread or threading the warp through the heddles will be saved many times over in a day, where hundreds of employes are performing the same operation all day long. Nothing helps so much as to be able to see clearly every thread, strand, eye. Shadows make hiding places, and in commercial work we do not want to pay for hide-and-seek games.

Much work requires the operator to move about and tend to several looms or spindles. If one has to pass from looking at a brilliantly lighted spot to a dark alley, and then to another light spot in the middle of a light field, the eye takes a certain amount of time to accommodate itself to the changed condition. This is one of the evils of brilliant localized lighting. Besides tiring the eye it slows down the whole work.

Similarly looking at the bare lamp itself blinds the operator and makes it difficult to see beyond the lamp as is necessary in tending a group of looms. Well diffused light is more comfortable to work by and eliminates dense shadows. Where units emitting a large amount of light from a small area are used it is practically impossible to get good light anywhere except on the tops of the nearest looms.

All non-productive motions reduce the output. A good lighting system takes none of the operator's time, does not require him to move lamps about, adjust cords, reflectors, etc. Much that I have said that promotes the quantity of the output improves the quality. Good lighting is, of course, necessary for inspection, but the prevention is better than the cure. A good illumination all along the way will keep out, to a large extent the very thing that inspection is to reveal. One mill found that a number of pieces which had to be sold as seconds was reduced by from 25 per cent. to 4 per cent. under its new system of lighting.

The personal elements of satisfactory conditions for the operator, is of attention-demanding importance. Psycological effects may be vaguely understood, but they exist. As it grows dark in the afternoon, the natural impulse is to relax and prepare for rest,—that's just natural—but we can arrange our artificial lighting so that the passing from day to dark will be very little noticed. A light-colored well illuminated room suggests awakeness, not sleep.

The great enemy of efficiency is fatigue. Fatigue is necessary to production, but if it must exist, let it be as a result of productive labor. A poor lighting outfit tires the eye, which in turn tires the whole being. Are you taking the employe's strength and giving no returns?

Then there are accidents—"even in the best regulated" factories—but they may be materially reduced by providing an illumination which makes slips and entanglements less likely.

Everything that promotes the health, comfort and efficiency of the worker helps to get and keep a satisfactory and satisfied working force and satisfaction is the best antidote for labor troubles.

The mill manager will naturally ask, "What method or system satisfies the conditions here named?" There are many systems and each has its advocate, more or less prejudiced by commercial affiliation. The writer must confess to such prejudice himself.

The mill man desirous of remodeling his lighting installation should bear in mind always that his object is to improve the quality and increase the quantity of his output. This is the only consideration. To accomplish this the installation must be planned by one who knows not only the lighting business but one who knows also the tex-

tile industry from the cotton bale to the cloth jobber.

You are not interested in lamps, or watts per candle, or lumens per watt, or foot-candles; these are factors dealt in by the lighting expert. You are interested in yardage—and equipment which satisfies your conditions must be equipment which will add to your profits.

Twelve o'clock having arrived, the time appointed for the business meeting, the various committees presented their reports, the first being that of the Committee on Publicity, presented by R. M. Miller, Jr., Chairman. No special action had been taken, but Mr. Miller advised th committee's continuance, and it was so ordered.

The Joint Committee on Ginning, Baling, etc., was continued over for another year.

The Committee on Uniform Sales Contracts reported that they had completed their services, drafted the contract, which had been circulated among the members, and urged its adoption. From the latest information the committee has received, it would appear that the sales note is not in general use, which they consider unfortunate considering the great amount of time and thought which has been given to this subject and the many advantages which would accrue to both manufacturers and buyers through its use. It is urged that more of the members avail themselves of its benefits.

Secretary and Treasurer C. B. Bryant then read his report, telling of the work of the Association during the year, three meetings of the Board of Governors that had been held and an important joint meeting with the Board of Government of the National Association of Cotton Manufacturers, alluded to in the President's report. The Secretary recommended that some evidence of appreciation should be shown the Hon. John W. Weeks for his efforts in behalf of the Appalachain and White Mountain Forest Reserve Bill. The Association appointed as delegates to the International Cotton Congress at Barcelona, J. M. House and Ralph M. Odell, who are special commercial agents in the Dept. of Commerce and Labor. The finances of the Association are in a flourishing condition and the membership has reached high-water mark, being now in excess of 1000.

The Committee of Resolutions reported resolutions of thanks to the Richmond Chamber of Commerce and to others who extended hospitality to the convention; to John W. Weeks for his support of the Forest Conservation Bill; they recommended that the Hon. Chas. W. McCara, the President of the International Master Spinners Association, be elected an honorary member and that congratulations for the recent honors bestowed be extended. They also recommended that a standing comittee of fifteen for tariff and other legislation be appointed by the President to act for and represent the Association in matters of legislation. Resolutions of thanks to the cotton farmers present were extended, and an invitation to come again.

Stuart W. Cramer offered the resolution that medals similar to those already awarded should be given to former presidents of the Association who had not received them before this custom began.

Suitable resolutions were offered on the death of Charles K. Oliver, former Chairman of the Board of Governors.

A resolution was adopted favoring the method of gin compression, and a committee of three appointed to co-operate with the farmers.

The election of officers resulted in the unanimous choice of the following ticket: President, Ellison A. Smyth, Greenville, S. C.; Vice President, W. A. Erwin, Durham, N. C.; Secretary-Treasurer, C. B. Bryant, Charlotte. N. C. Four new governors were elected, as follows: John A. Law, Spartanburg, S. C.; Wm. E. Hooper, Baltimore, Md.; Stuart W. Cramer, Charlotte, N. C.; T. A. Wainwright, Stonewall, Miss.

The entire new Board of Governors is now as follows: C. D. Tuller, Chairman, Spartanburg, S. C.; Wm. E. Hooper, Baltimore, Md.; Ridley Watts, New York; C. H. Moody, Alabama City, Ala; W. T. Bryan, Athens, Ga.; Carroll Baldwin, New York; S. W. Cramer, Charlotte, N. C.; L. D. Tyson, Knoxville, Tenn.; W. H. Harris, Pawtucket, R. I.; W. E. Beattie, Greenville, S. C.; Caesar Cone, Greensboro, N. C.; Scott Maxwell, Cordova, Ala.; J. P. Eddy, Providence, R. I.; T. L. Wainwright, Stonewall, Miss.

In compliance with the resolution adopted, the President appointed the Committee on Tariff, as follows: R. M. Miller, Jr., Chairman; D. Y. Cooper and S. W. Cramer, North Carolina; A. H. Bahnson, Virginia; Lewis W. Parker, J. D. Hammett and J. H. Morgan, South Carolina; C. D. Tuller and T. J. Hickman, Georgia; Scott Maxwell, Alabama; T. D. Tyson, Tennessee; T. L. Wainwright, Mississippi; Paul J. Marrs, Kentucky; A. W. McClellan, Louisiana; one member from Texas to be appointed later.

The meeting then adjourned.

The social features of the convention were as usual in the hands of an efficient committee of the Chamber of Commerce, of which Mr. John M. Miller, Jr., was Chairman, assisted by Mr. Christian Clark and a ladies' auxiliary reception committee under the most efficient direction of Mrs. Christian Clark.

The acquaintances formed at previous conventions led to many pleasant reunions. The visiting ladies were hospitably entertained by the Ladies' Committee of Richmond. Automobiles were placed at their disposal and many informal parties were gotten up to visit interesting parts of the city and the beautiful Country Club, which was thrown open to visitors and guests of the convention. The Commonwealth and Westmoreland Clubs in the city also extended their hospitality to the visitors.

The entertainment on Thursday evening, which was tendered by the Chamber of Commerce, was a most enjoyable affair. The auditorium in which the conventions were held was the scene, and the formal exercises consisted of addresses by John M. Miller, Jr., of the Chamber of Commerce, Vice President Carrington, Gov. Mann of Virginia and Mayor Richardson of Richmond. Some stirring speeches were made which were enthusiastically received by the audience, which completely filled the large hall. A musical program followed, including several impromptu songs, and one selection in particular which was many times encored was the remarkable whistling of Mr. R. H. Westbrook, connected with the Buckeye Electric Co. Later in the evening, the hall was cleared for dancing and refreshments were served. Again the Reception Committee won much credit for their successful entertainment.

The party which made the trip to Richmond by boat from Boston were much envied by their sweltering associates who had come in by rail Wednesday night. They had a fine trip. The water was smooth as a millpond all the way and the day spent at Old Point Comfort was a pleasant outing. The Merchants & Miners Transportation Co. made a special effort to take care of this party, and a vote of thanks was extended to Mr. Barber, the personal conductor, for the arrangements he made for their comfort. Everyone had a good time from the time the boat left the dock until it touched at Norfolk.

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The Allis-Chalmers Co., of Milwaukee, exhibited in the large lobby of the hotel a model of their steam turbine, with a large cross section cut out to show the way it works. This was constantly surrounded by an interested group. Mr. Miller and Mr. Merrill of this company were in attendance.

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The Corn Products Refining Co. had an exhibit of their products in great variety. Mr. E. B. Waldron, the general sales manager, attended the convention and headed a delegation from this company, which included in addition Messrs. J. W. Lindau, Gilbert and Guion.

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The U. S. Gutta Percha Paint Co. distributed pretty souvenir pins, and had an exhibit of Rice's Mill White paint. Mr. West, who is always in atendance at the conventions, was present, as well as their southern representative.

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The system of registration and identification was a good one. Each member and guest received- a handsome badge in the form of a silver check, with a strap for attaching to the buttonhole. He also received a numbered pin, the number corresponding to that against his name in the list of members furnished in a booklet.